

RICE UNIVERSITY

**Manifesting Exchange**

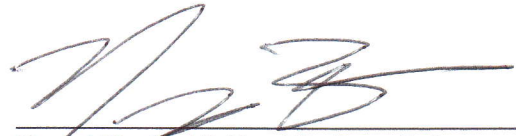
by

**Elena Spring English**

A THESIS SUBMITTED  
IN PARTIAL FULFILLMENT OF THE  
REQUIREMENTS FOR THE DEGREE

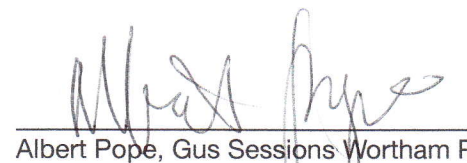
**Masters of Architecture**

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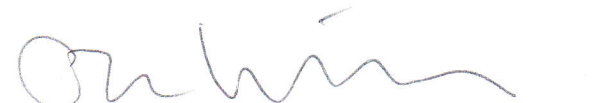
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## ABSTRACT

### Manifesting Exchange

by

Elena Spring English

Exchange is at the core of public space. Whether trading products or sharing information, exchange between people produces social interactions and spatialized hubs of activity. Without exchange public spaces fail.

Today, the Internet threatens older methods of spatialized exchange as people communicate through email, pay bills electronically, and shop online. These despatialized forms of exchange are having a damaging impact on previously functioning public spaces such as the post office and retail stores. Distribution centers, meanwhile, are thriving as product exchange points but they remain completely invisible and inaccessible to the customer.

With the United States Postal Service in rapid decline, once monumental buildings will soon be abandoned. Taking advantage of the existing infrastructure of post offices, I am proposing a centrally located public distribution center; giving online companies a physical presence in the city, monumentalizing the currently despatialized market, and reintroducing the public to the exchange process.



## ACKNOWLEDGEMENTS

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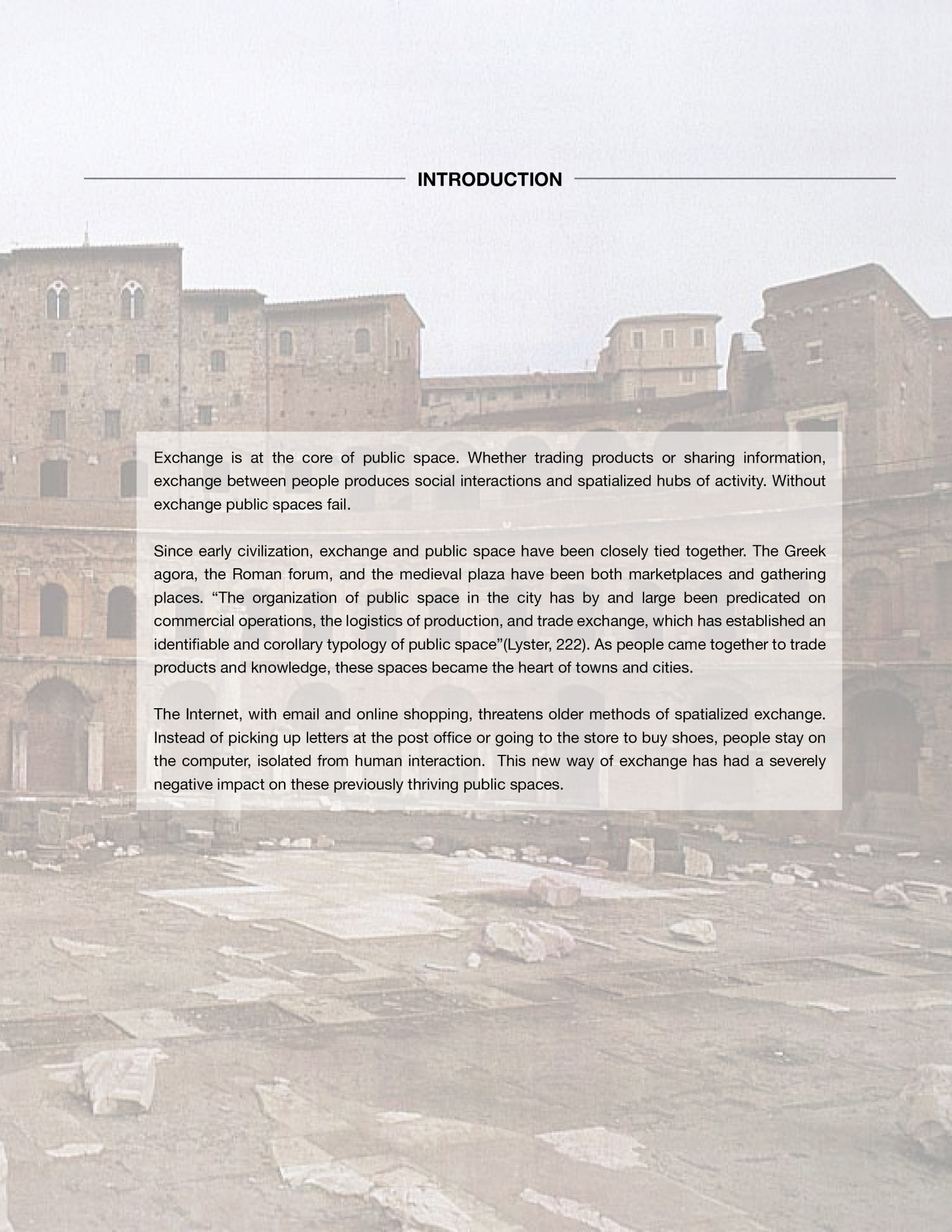




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## INTRODUCTION

Exchange is at the core of public space. Whether trading products or sharing information, exchange between people produces social interactions and spatialized hubs of activity. Without exchange public spaces fail.

Since early civilization, exchange and public space have been closely tied together. The Greek agora, the Roman forum, and the medieval plaza have been both marketplaces and gathering places. “The organization of public space in the city has by and large been predicated on commercial operations, the logistics of production, and trade exchange, which has established an identifiable and corollary typology of public space”(Lyster, 222). As people came together to trade products and knowledge, these spaces became the heart of towns and cities.

The Internet, with email and online shopping, threatens older methods of spatialized exchange. Instead of picking up letters at the post office or going to the store to buy shoes, people stay on the computer, isolated from human interaction. This new way of exchange has had a severely negative impact on these previously thriving public spaces.

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## TYOLOGY: THE UNITED STATES POST OFFICE

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The United States Postal Service was established as a way for the government to connect and unify a young nation; it has served to keep people in all parts of the country informed and linked to one another. From the pony express, to railroads, and now trucks and airplanes, mail has been moved to every part of the country to reach every person and keep them united as a nation.

From the start, the post office, or wherever the mail was collected and distributed, was a place of convergence. Not only did letters, money, and newspapers arrive here but so did people come to collect said items. Until the 1860s, city dwellers had to come to the post office to receive their mail. And, until the introduction of the Rural Free Delivery (RFD) Program in 1902, farmers and other small town occupants had to make the long trip into town for their mail (Reebel, 19). However, it became a time and place to meet neighbors, exchange news and gossip, and pick up other goods in town as well.

As physical representations of the government and exchange, post offices are often monumental buildings located centrally in cities and towns, creating a network of civic identity and public spaces. To assert the power of a governmental building, many early post offices were built with high-end materials and ornate classical detail. Built to last, post offices remain some of the most historical and elaborate buildings in cities and towns across the country. Though civic buildings, only the lobby, a small portion of the post office, is public. The remainder of the space is used for processing and sorting the mail moving through the building.

With the purpose of moving and delivering physical forms of communication and information, post offices were located near major infrastructures including highways, rivers, airports, and often sharing railroad tracks with union stations. Clare Lyster, in her 2006 article "Landscape of Exchange: Re-articulating Site," refers to these moments as "collisive sites" where there is intense "interactivity" and "exchange is thus multiplied and accumulated across multiple networks that occupy these collisive sites, suggesting a large scale of transfer or inter-exchange at a specific moment in time" (228). This overlap of products, knowledge, and people moving through these hubs present sites for new public spaces tied to closely the exchange process.



Fig. 02 Monumental Post Office



Fig. 03 Post Office as Thriving Public Space



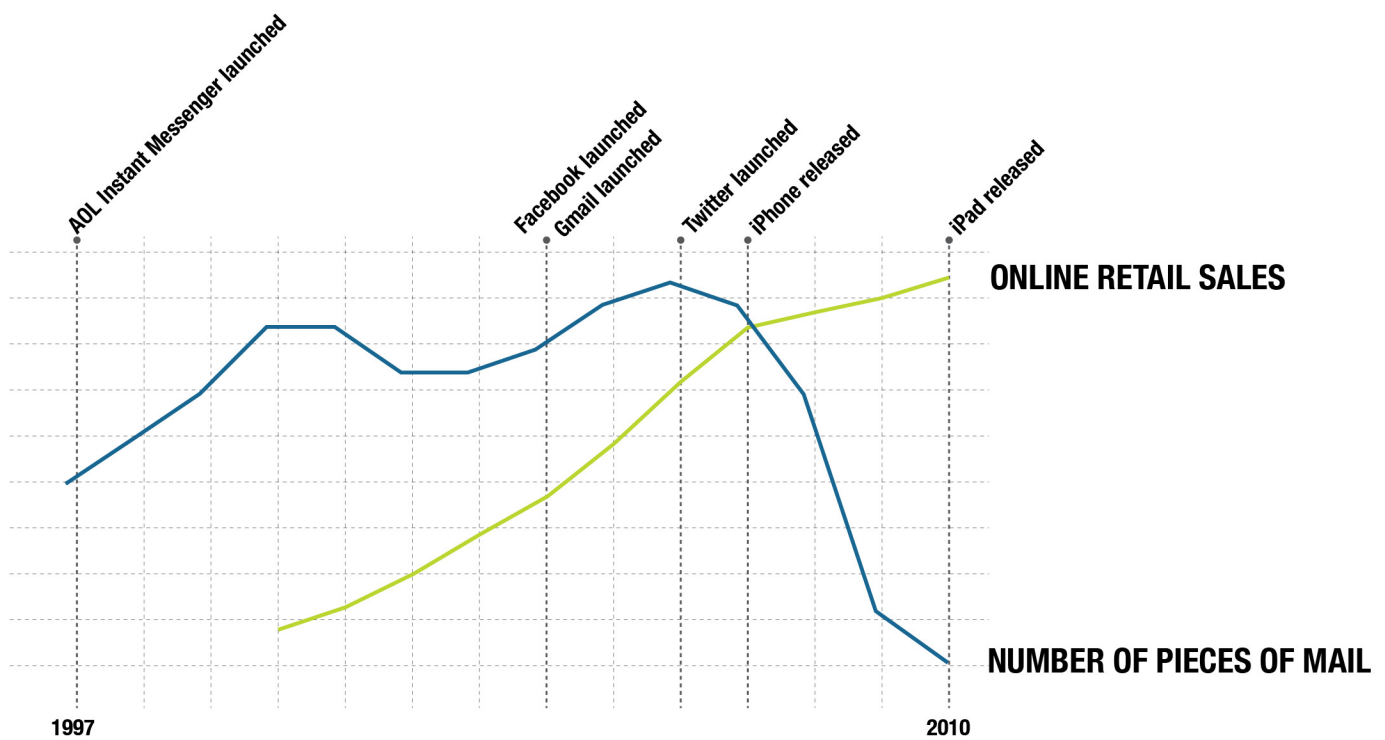


Fig. 04 Decline in the USPS

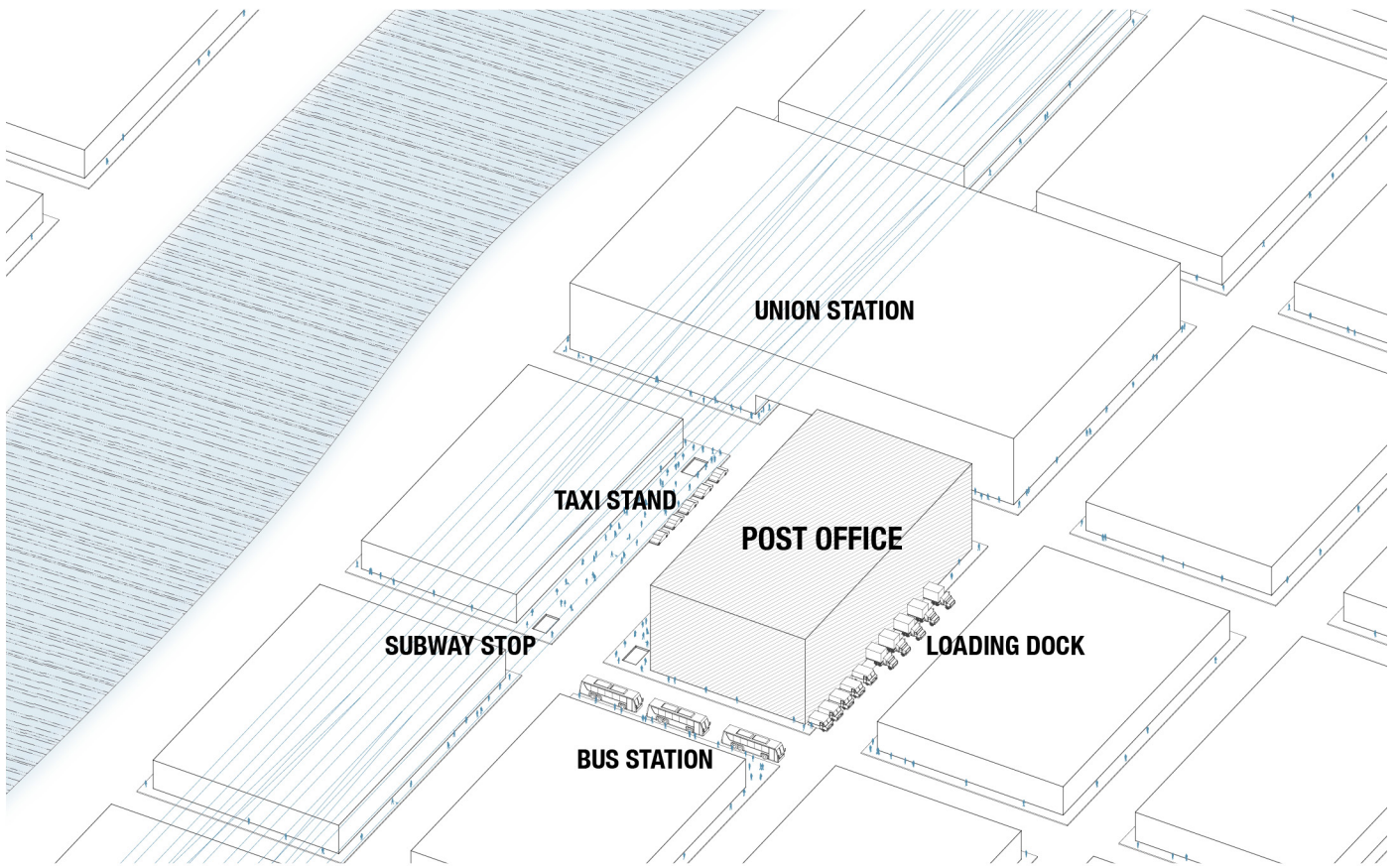


Fig. 05 Typical Urban Plan

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## TPOLOGY: THE DISTRIBUTION CENTER

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While retail stores and post offices are suffering from the Internet age, online companies and their distribution centers are thriving. Package mail is on the rise from the increase in online shopping but private couriers, not the United States Postal Service, monopolize this business. These online businesses house and process their goods in distribution centers across the country for easy access and quick delivery to customers.

Unlike the monumental public building of the post office, the low-lying, unmarked distribution centers are invisible in the landscape. Located in rural sites, closed off from the public, they are integral parts of today's exchange process yet practically nonexistent to the consumer.

One possible reason for this lack of physical presence is a 1992 court ruling declaring that a company only has to pay state taxes if it has a physical presence in the state (*Quill Corp v North Dakota*). Since 2011, lawmakers have been working to overrule this decision in order to eliminate the advantage this law gives online companies over brick-and-mortar stores (Peterson). Once overruled, online companies may be eager to establish storefronts in major cities, giving themselves a presence and a new way to advertise their company and products.

Most distribution centers, such as those operated by Amazon.com, are low-tech storage facilities run with high-tech software. They are organized for greatest efficiency, aisle after aisle of goods are stored according to their size and shape rather than product type. This way more product can fit into a warehouse, wasting as little space as possible. Computer systems store the product location and order information for workers to quickly move products from shelf to packaging to customer (*Amazon Warehouse's Processing*, video).



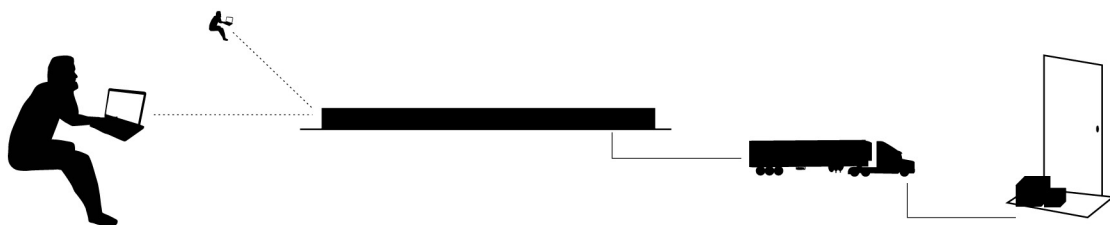


Fig. 06 The New Exchange Point



Fig. 07 Package Delivery Dominated by Private Couriers



Fig. 08 Interior of an Amazon.com Warehouse

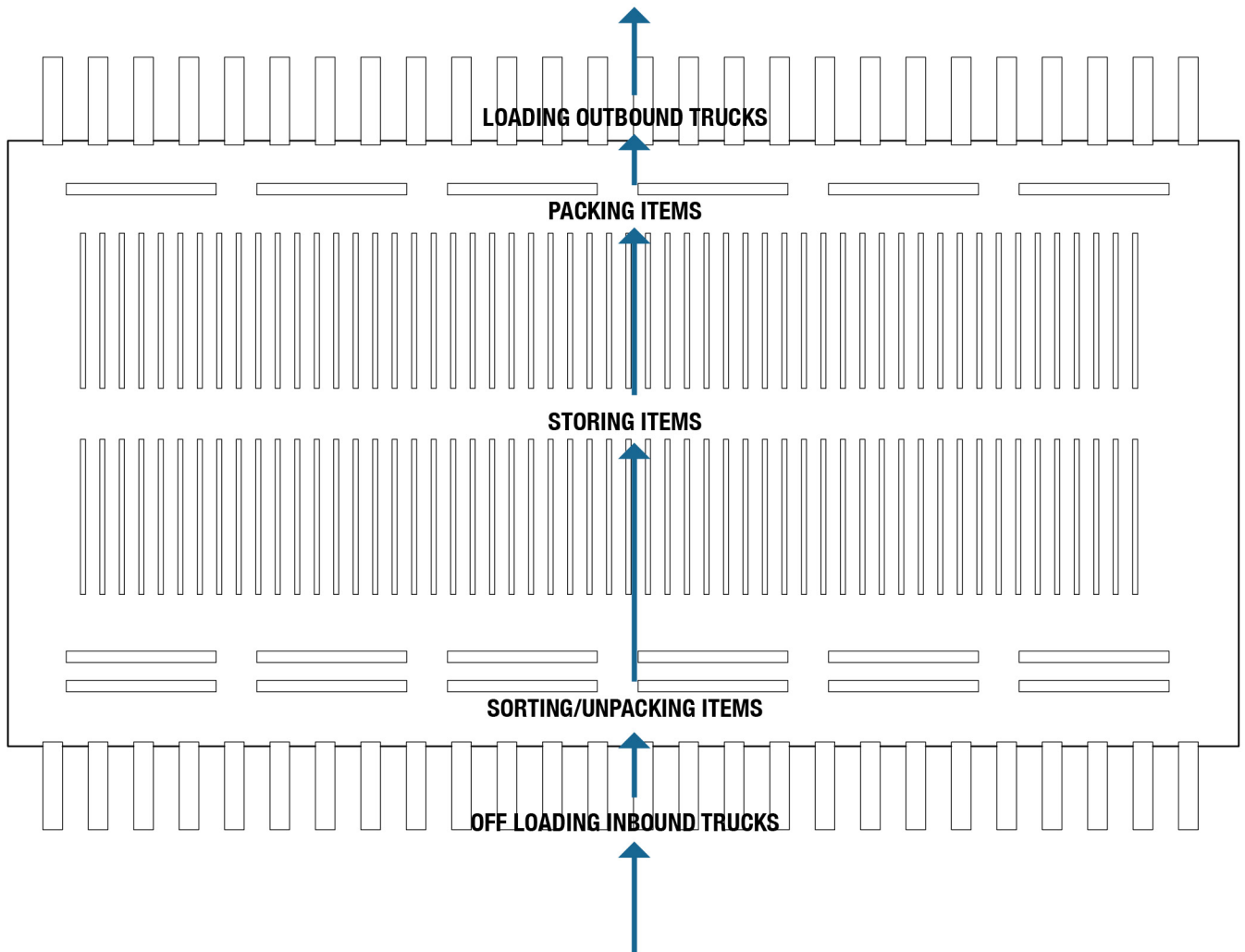


Fig. 09 Standard Distribution Center Layout







The background of the page is a stylized map of a city grid. A horizontal line across the top is labeled 'SITE' in bold, black, uppercase letters. Below this line, a vertical line runs down the center of the page. To the right of this vertical line, there is a circular area with a thick black border, representing a transit hub. The grid lines are thin and light gray, while the 'SITE' line and the hub border are thick and black. The word 'SITE' is positioned at the intersection of the horizontal line and the vertical line.

## SITE

The Farley Post Office in Manhattan is currently the largest operating United States Post Office. The Morgan Processing Center is located two blocks away creating a large post office hub in Manhattan. Located above Penn Station and next to the High Line Park, the post offices sit within a major infrastructural node with 600,000 people moving through on trains and buses daily (Amtrak and MTA *Annual Reports*).

This infrastructural point acts as a magnet drawing people in from across the country creating a large public with a diverse demographic. In the coming years this number is only expected to grow and increasingly diversify as more and more people move into the city. Amtrak is currently making plans to accommodate a nearly 200% increase in ridership over the next forty years (Amtrak, *A Vision for High-Speed Rail in the Northeast Corridor*).

Yet, at the same time, this collision point in the city is also a void. Situated between Manhattan neighborhoods, between urban typologies, and between program types, people quickly move through and out of the area with no real reason to stay.

By reestablishing this post office as new center of exchange, this site will stitch together the surrounding neighborhoods and take advantage of the existing infrastructure.

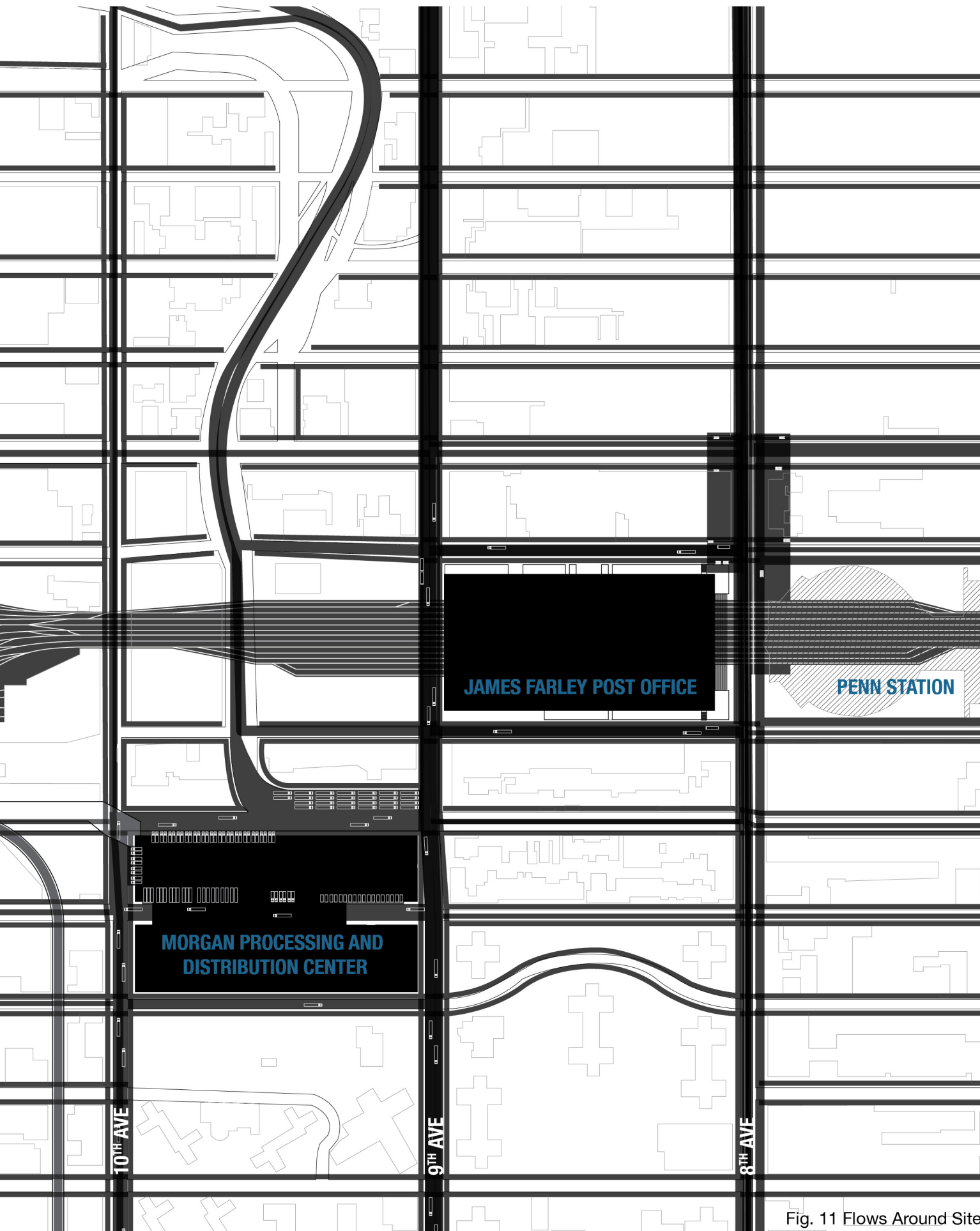


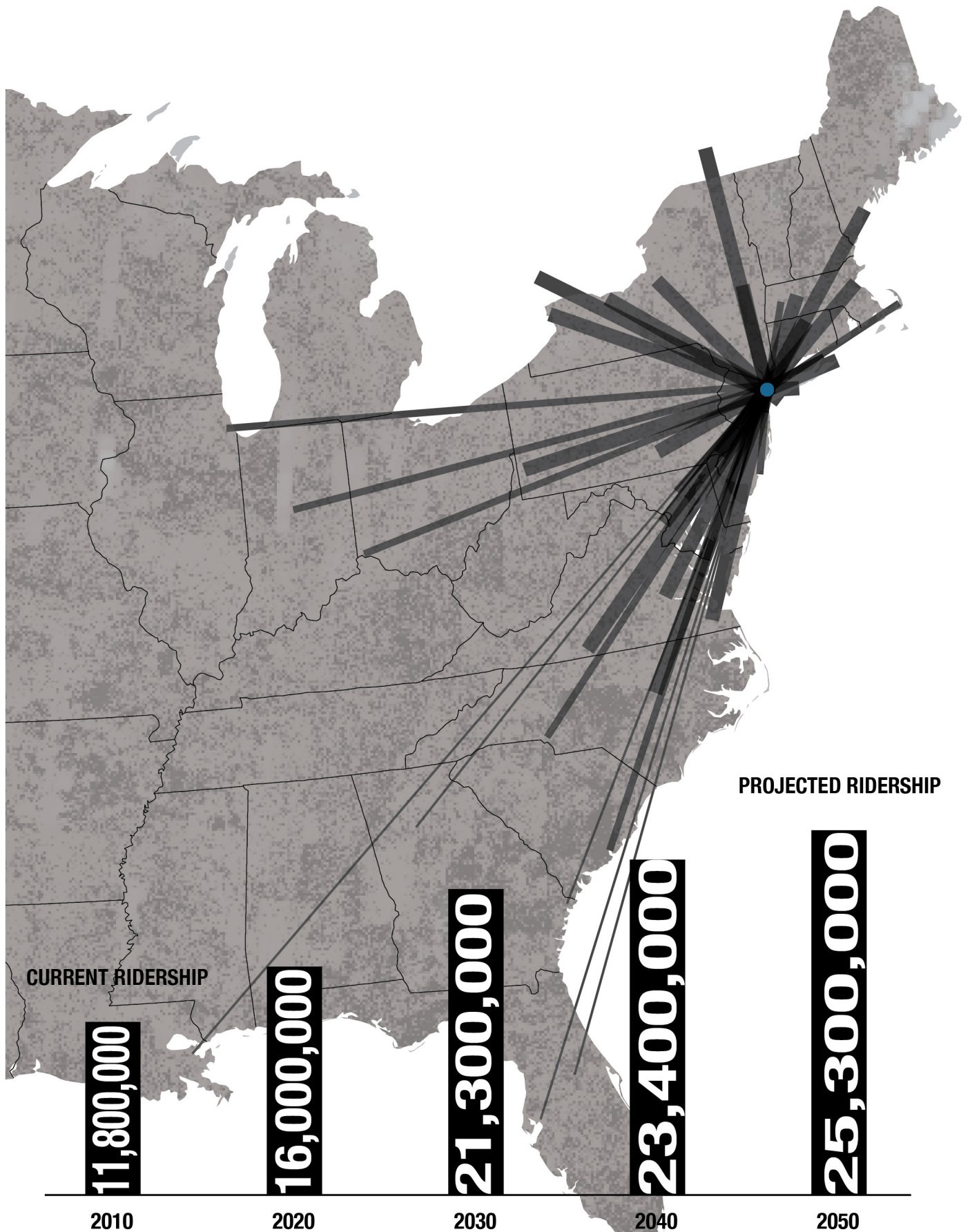
Fig. 11 Flows Around Site





Fig. 12 Regional Flows into Penn Station





Top: Fig. 13 Penn Station as a Magnet  
Bottom: Fig. 14 Northeast Corridor Master Plan

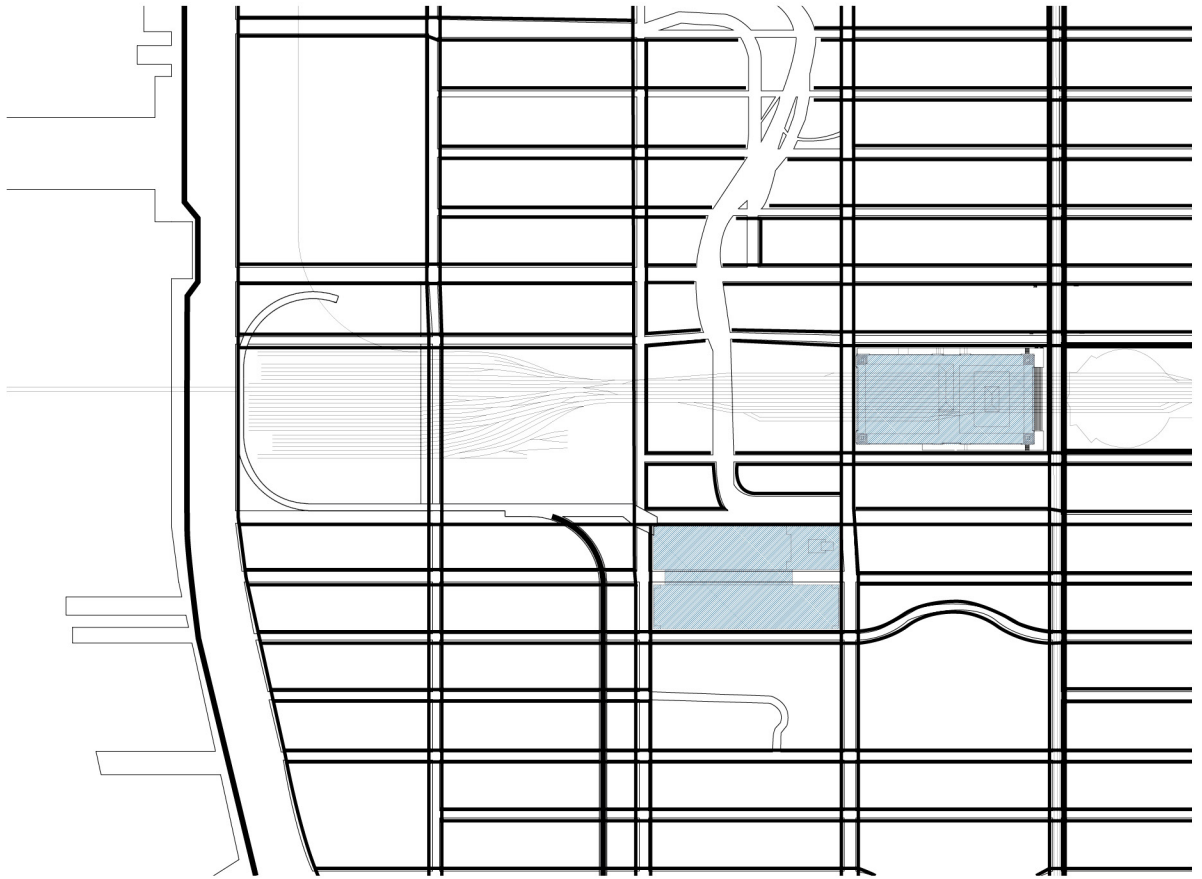


Fig. 15a Site Flows: Pedestrian

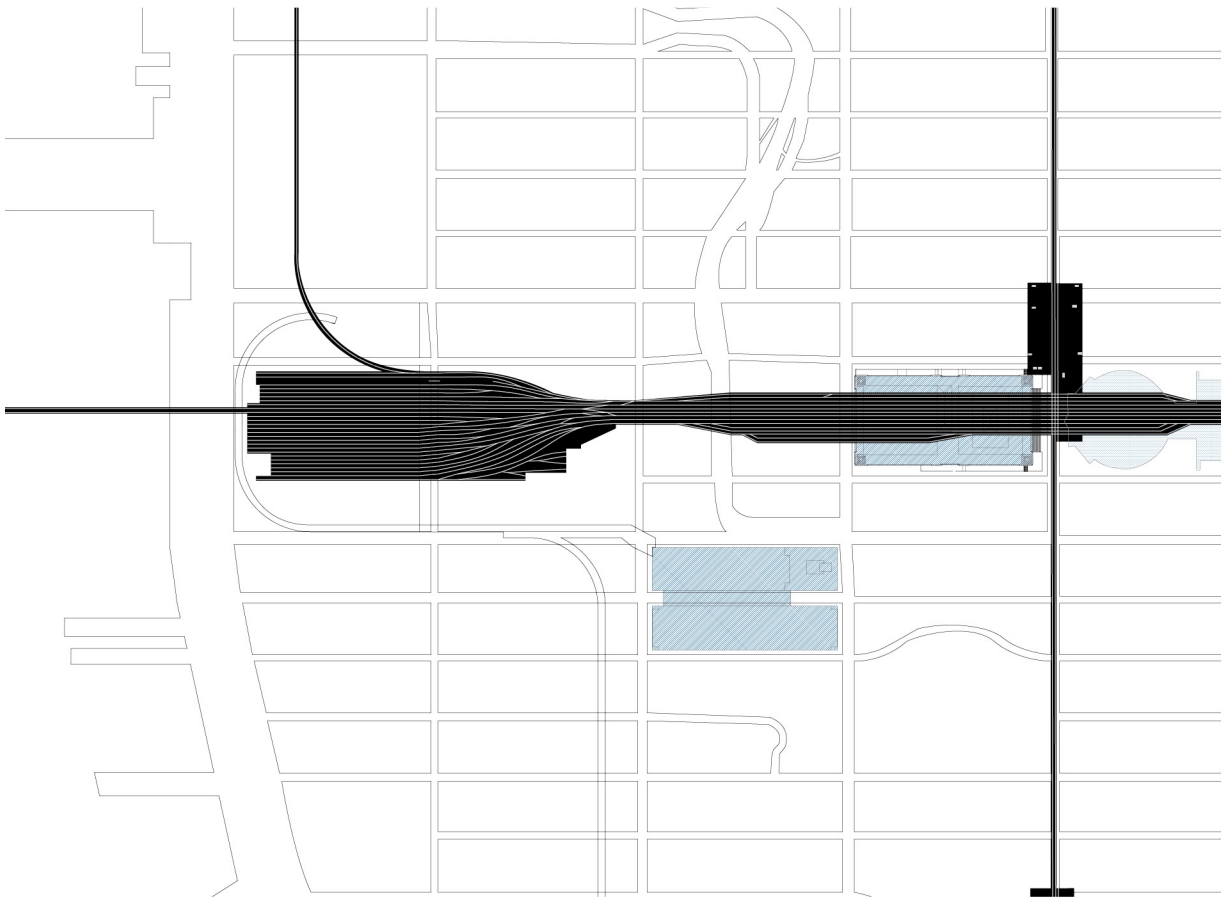
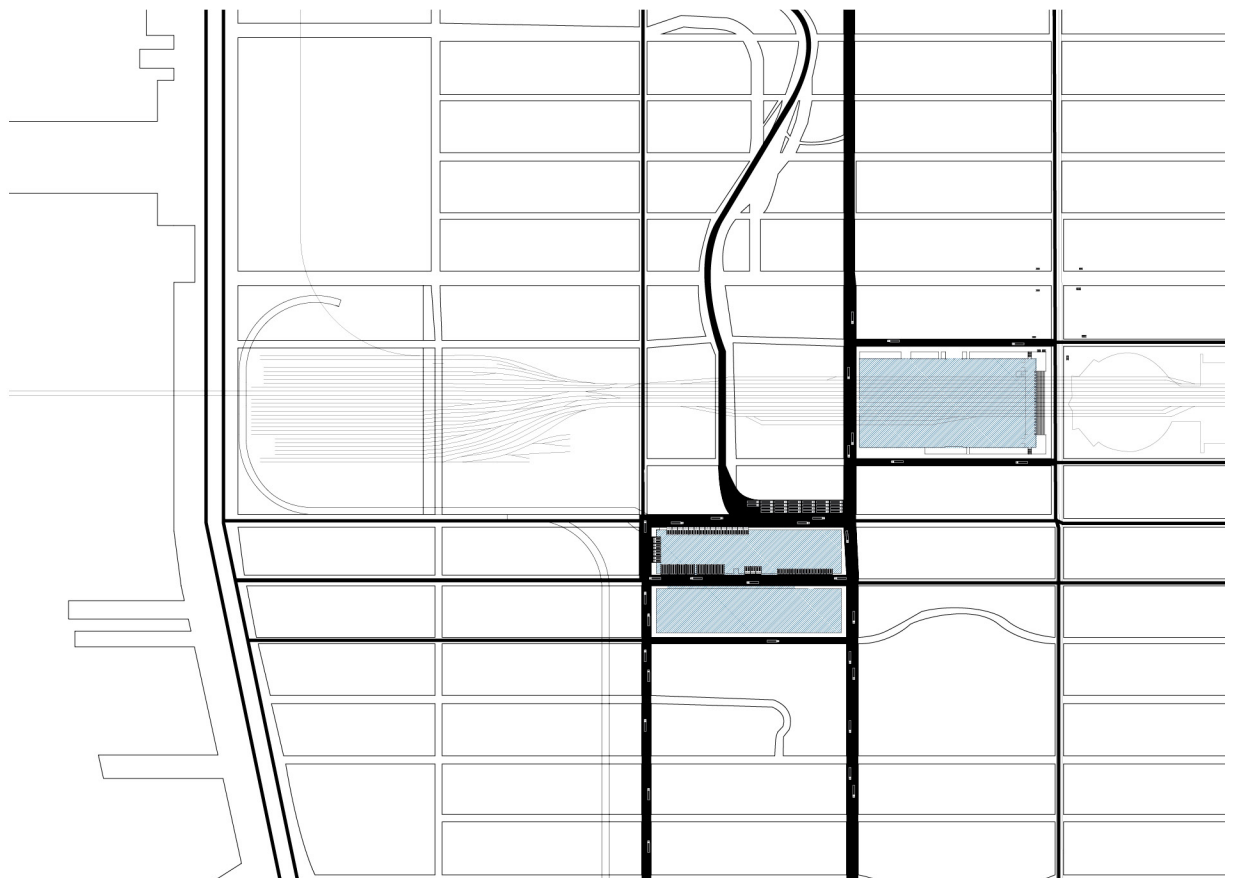
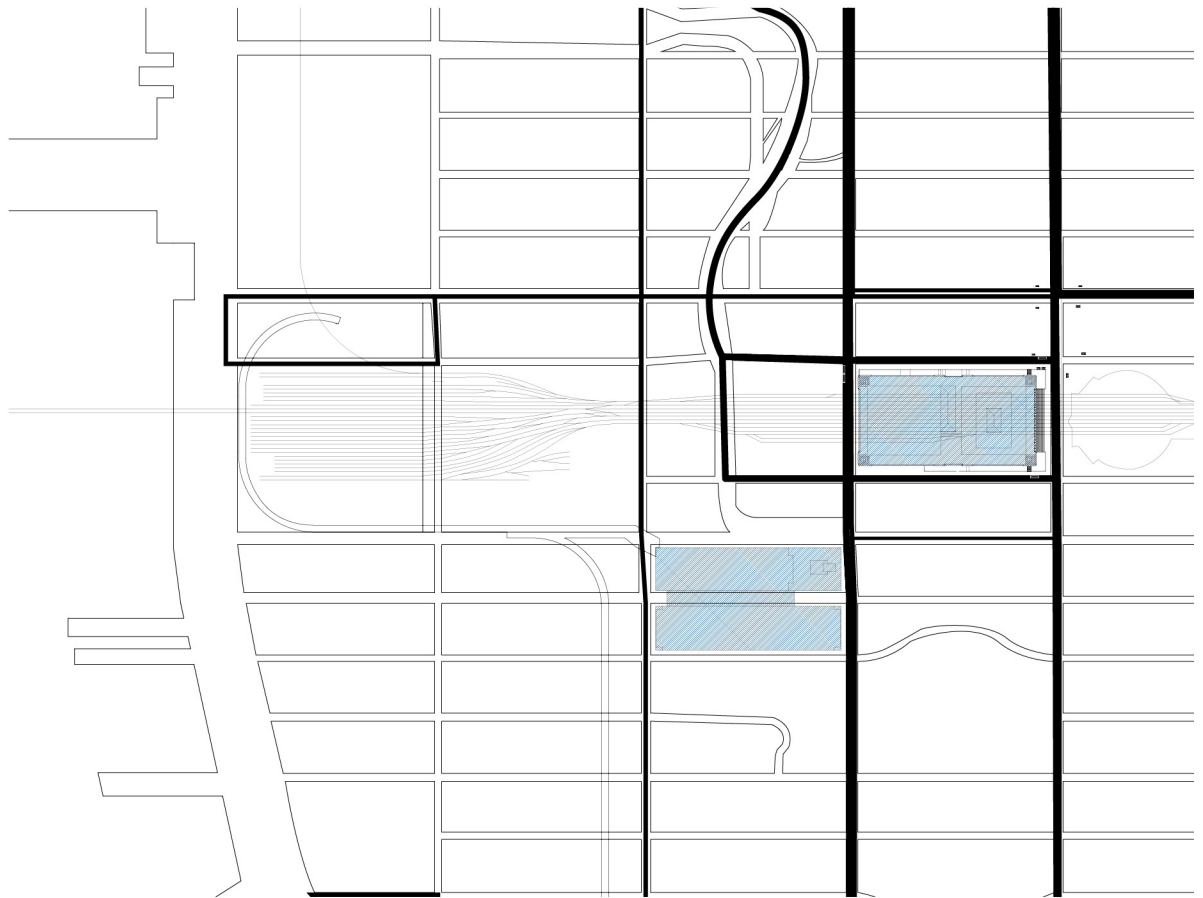


Fig. 15b Site Flows: Train



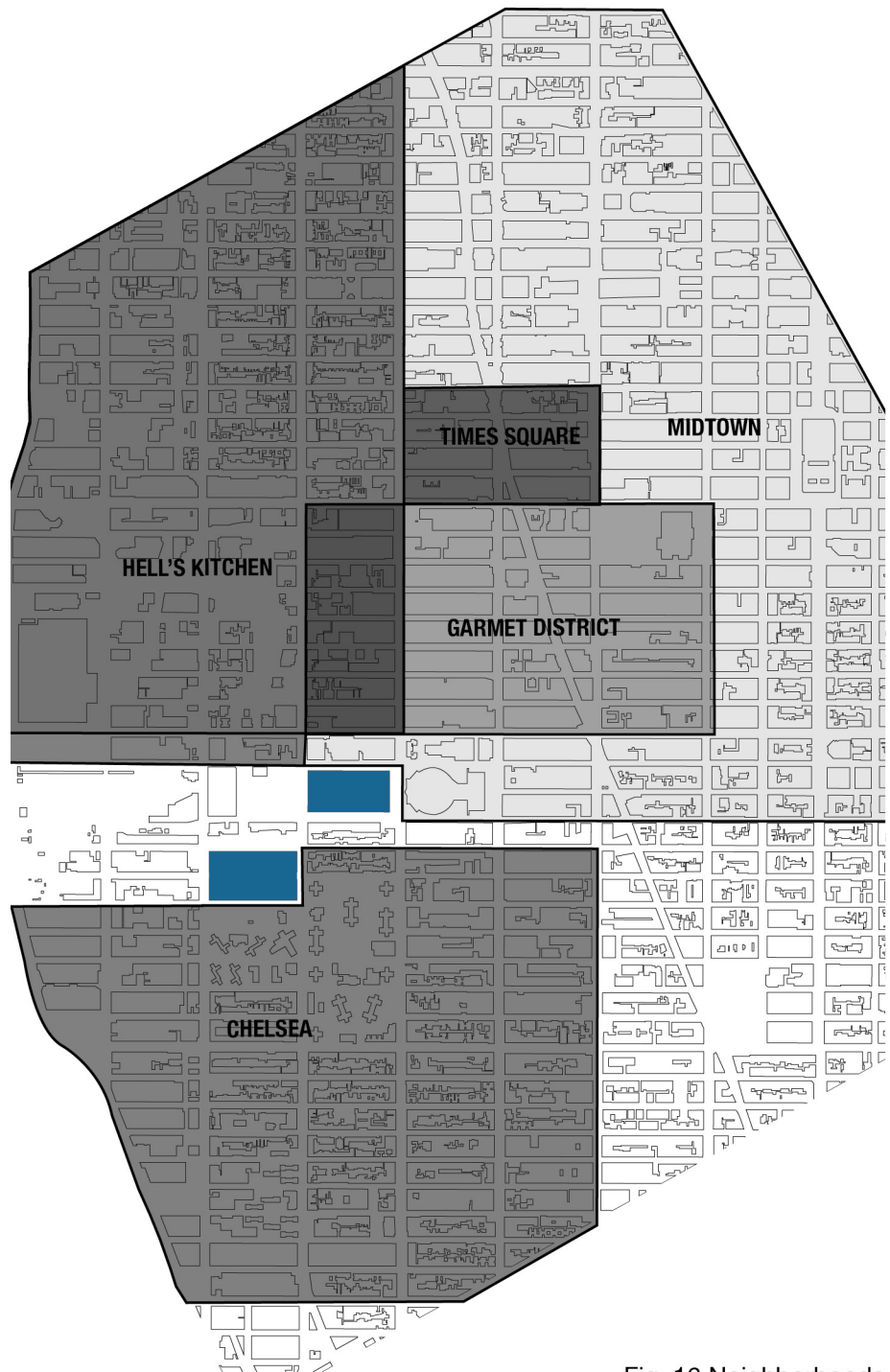


Fig. 16 Neighborhoods

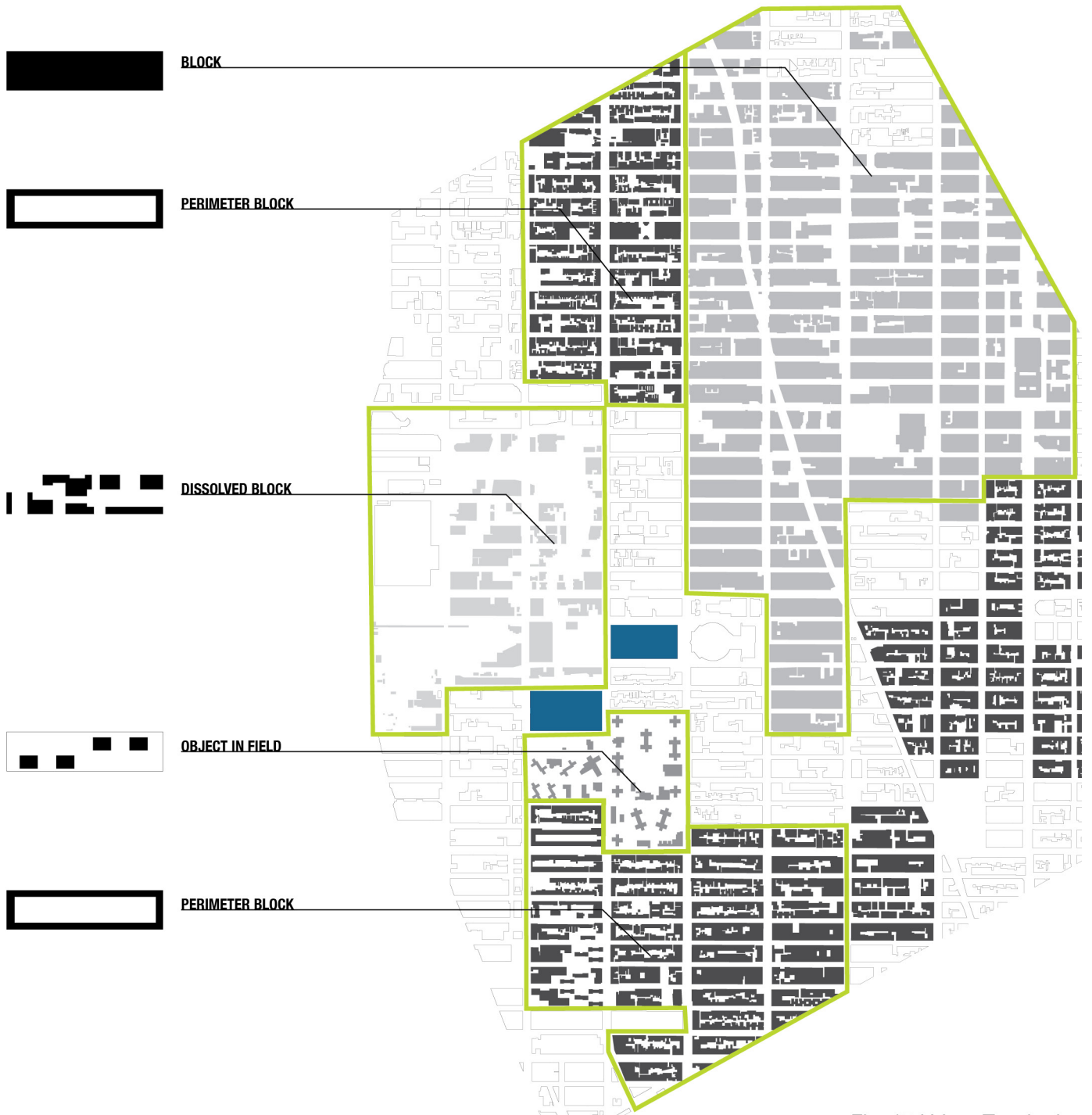


Fig. 17 Urban Typologies





**TRANSPORTATION**



**RESIDENTIAL**



**MIXED USE**



**COMMERCIAL**



**INSTITUTIONS**



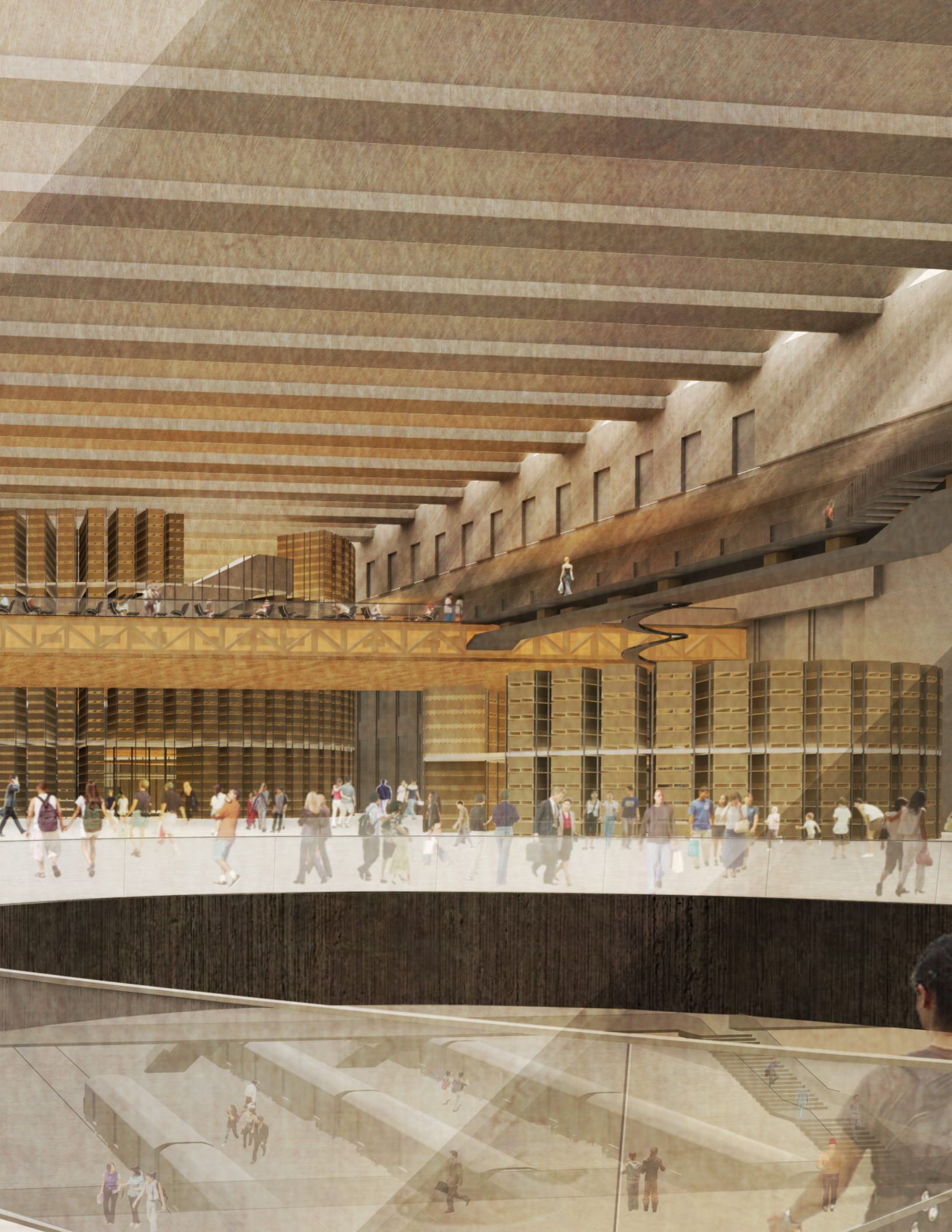
**INDUSTRIAL**

Fig. 18 Land Use











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## PROGRAM

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Due to the despatialization of exchange, human interaction is now limited and the public spaces once formed at these collision points are being abandoned.

What if the current models of exchange are once again spatialized and monumentalized to create a new type of public space?

Using the buildings left behind by the soon defunct United States Postal Service and taking advantage of the existing infrastructure, this thesis proposes a centrally located public distribution center; giving online companies a physical presence in the city, monumentalizing the currently despatialized market, and reintroducing the public to the exchange process.

With the push to eliminate tax breaks for despatialized internet retailers, such as Amazon.com, online companies can take advantage of prime locations in cities to market their goods and brand. At this location in Manhattan will be an online media company, continuing the lineage of the post office with communication and information exchange taking place in the building.

The company moving into this building sells media including books, DVDs, CDs, periodicals, etc. to individuals in-store and online as well as to small businesses in the area. They also provide space in return for customer loyalty and company advertisement. Programmed spaces throughout the building let people browse items, linger to read a book, or stop to use a computer. In addition, the company provides space for large organized events and more loosely organized markets run by small individual-run businesses.

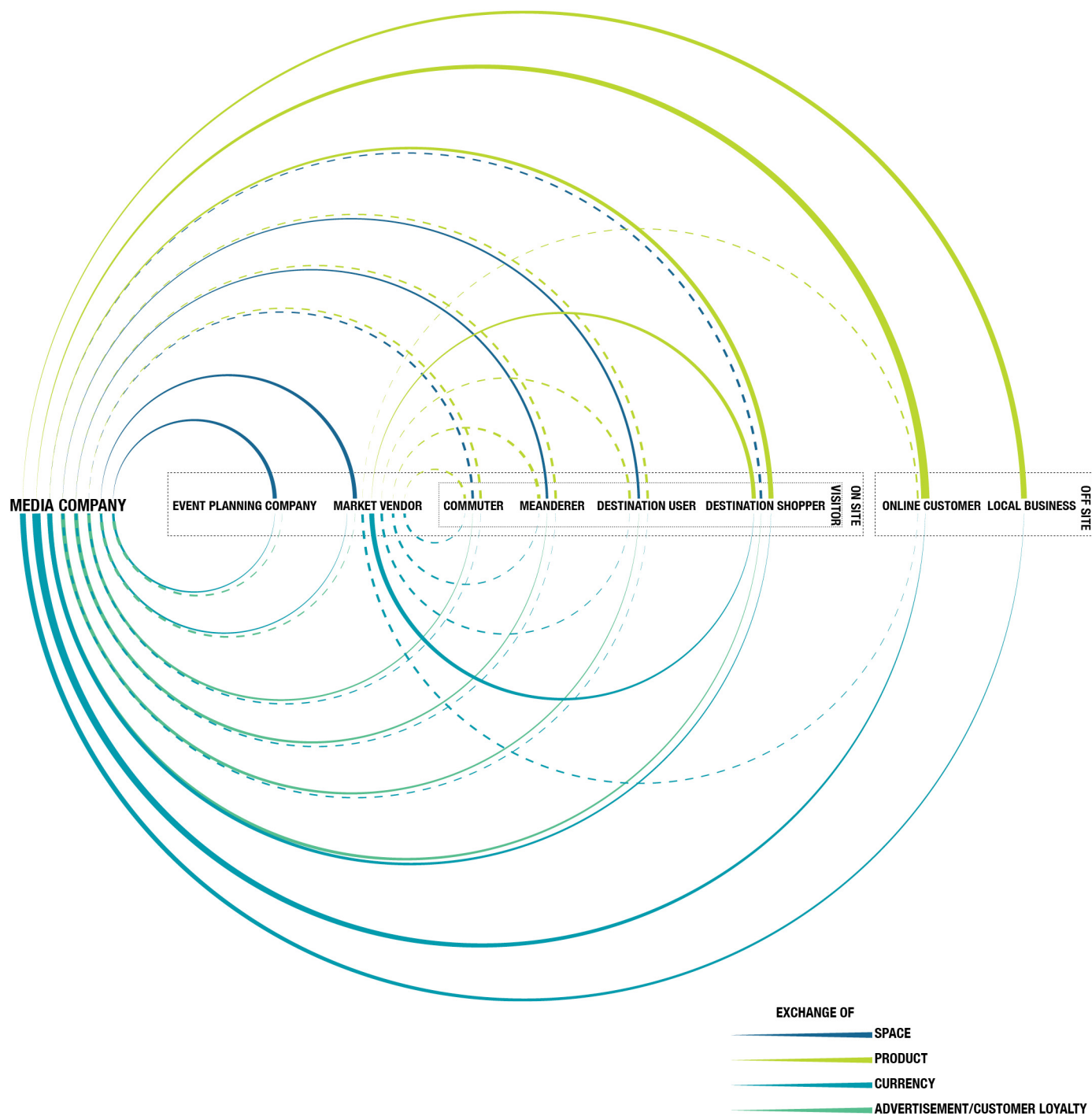


Fig. 20 Business Model





Fig. 21 Spatializing the Current Invisible Market











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## LOGISTICS

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The current organization of distribution centers, though efficient for moving product, lacks the space for the public to enter it. Customer and worker would be in one another's way and confusion would ensue.

To allow for the company to continue running efficiently while also creating public space, there must be a new layout. Storage in a frame configuration is inefficient and also creates logistical confusion, without a separation between public and logistics. A circle, however, provides efficient storage and a mode of separation. Considering forklift maximum reaches allows for stacking and a more monumental form of storage in a public space.

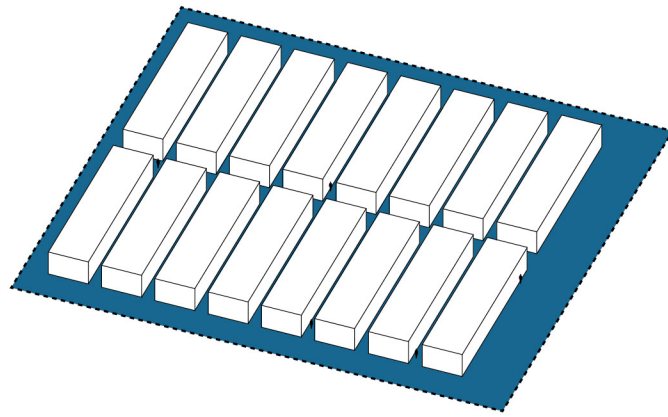
The overall company products are stored in three silo types, one for bulk items, one for individual unwrapped items, and one for outbound products.

The silos are arranged for easy truck access and to create pockets of various scales of public space on the main floor.

Absorption bars, where the user can consume the product, intersect each silo and relate to it programmatically.

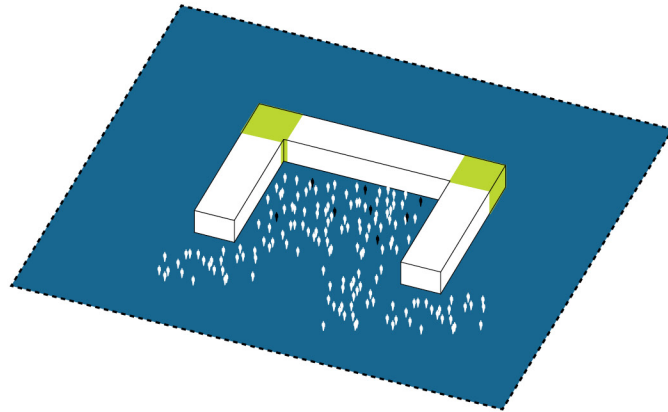
The main surface acts as a continuation of the city connecting the High Line and Penn Station as well as connecting programs within the building.





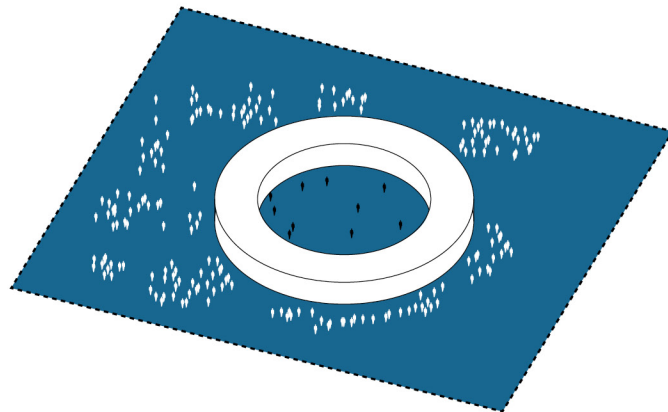
STANDARD LAYOUT

Efficient  
Little open space



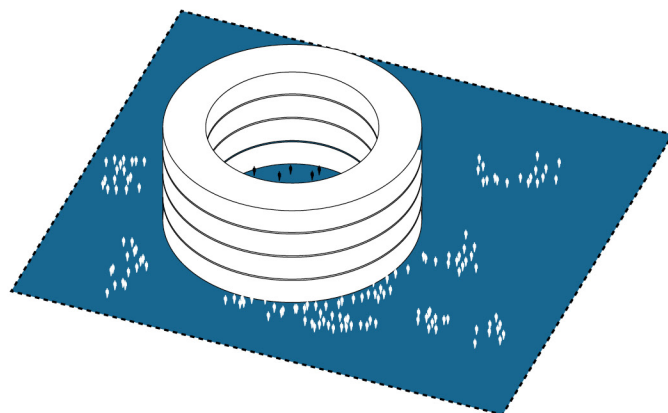
PERIMETER STORAGE

Wasted storage space  
Open space



CIRCULAR STORAGE

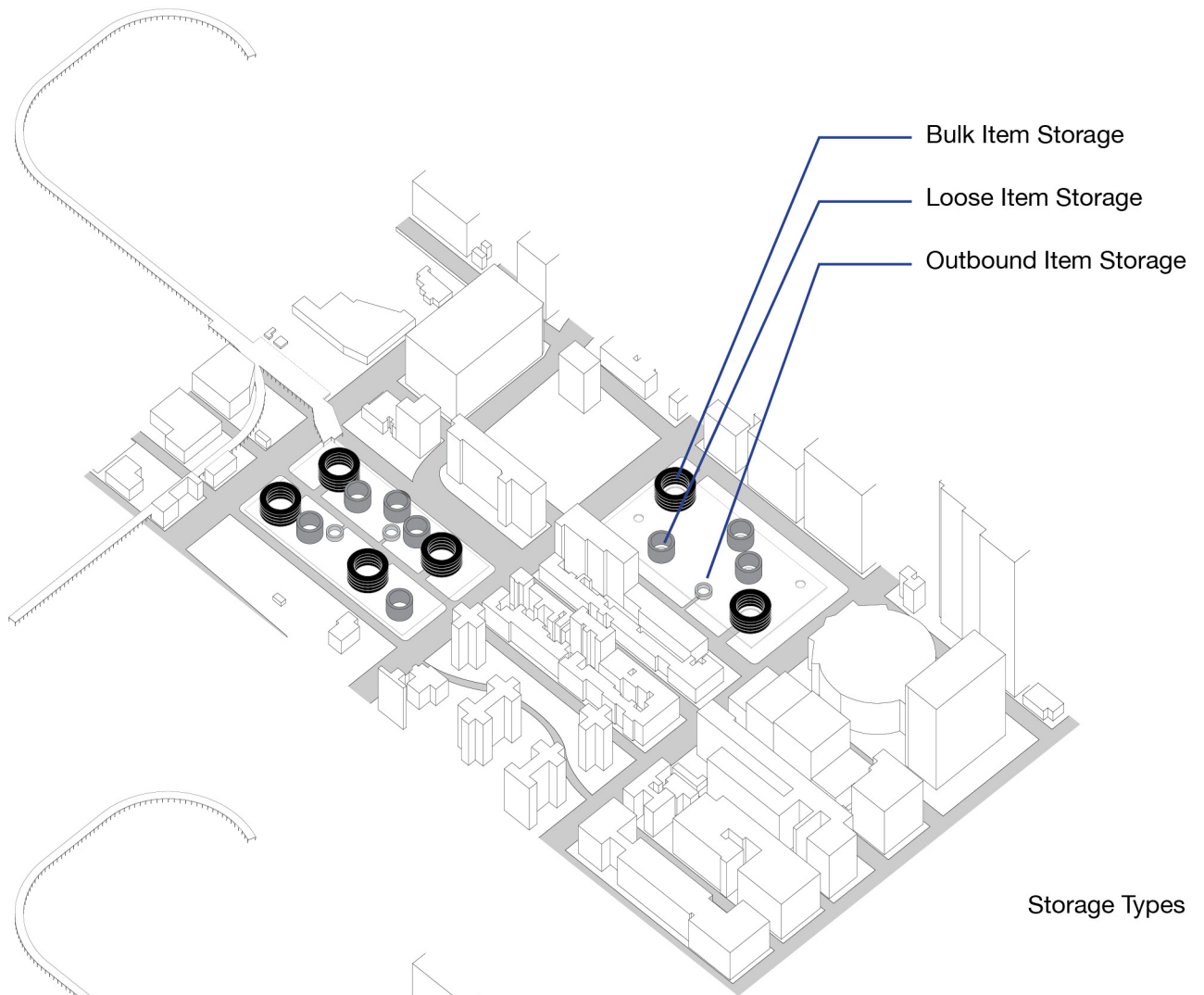
Efficient  
Open space



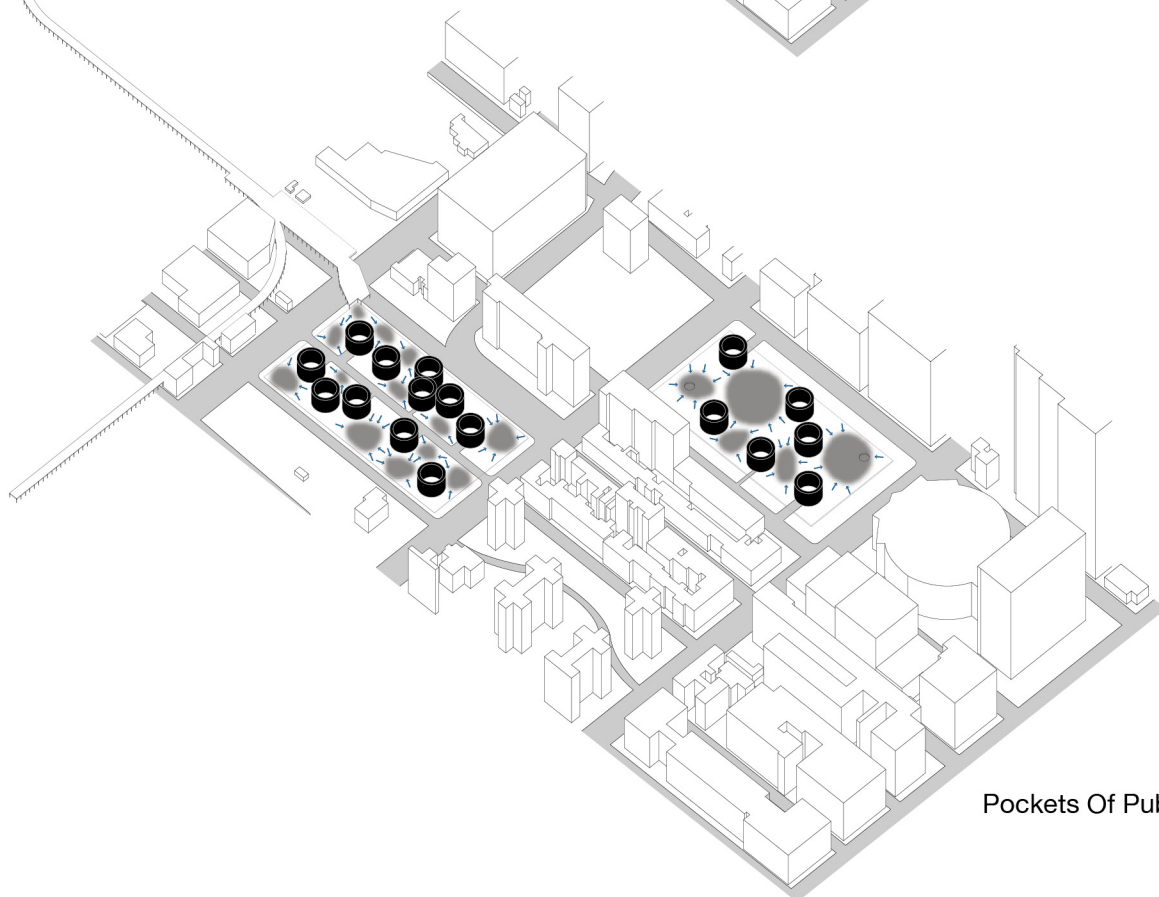
STACKED CIRCULAR STORAGE

Efficient  
Open space  
Monumental

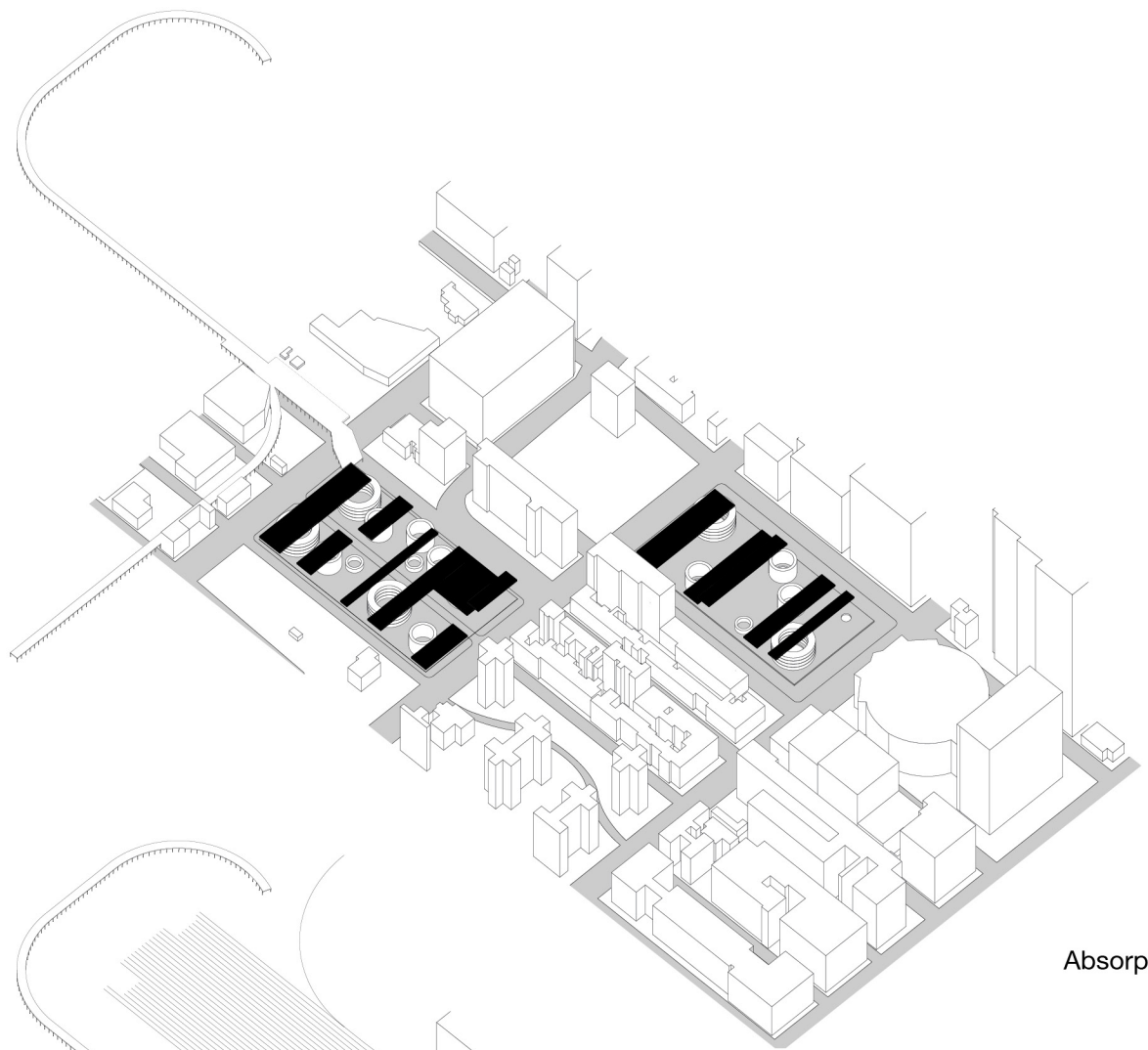
Fig. 23 Storage Efficiencies



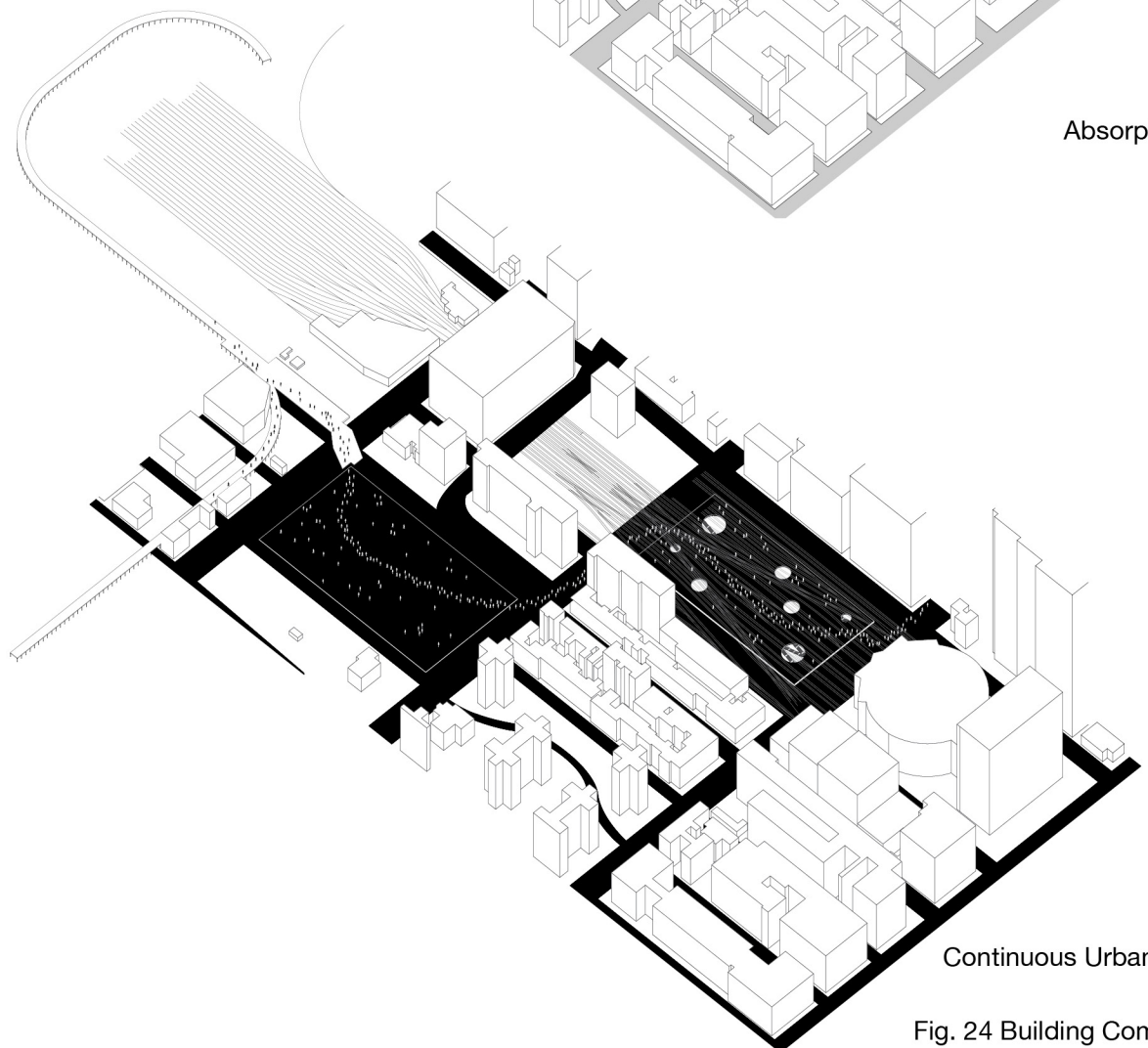
Storage Types



Pockets Of Public Space



Absorption Bars



Continuous Urban Surface

Fig. 24 Building Components

The products enter the building in bulk, where they are directly off-loaded into the largest silo type. Forklifts move the boxes onto the shelves where they can then be directly shipped back out to smaller companies or moved into the central platform to be unpacked and moved into the next silo. These bulk item silos are organized by product type: books, film media, music media, and journals. They are positioned along the side roads for truck access and loading docks.

The products that are unpacked move along conveyor belts to the individual item silos, where loose items are stored in a high density shelving system. Here the products are accessible to buy and browse. Or, if someone online orders the product, it will be unshelved and sorted by a worker before moving to the third silo type for shipping. Each of these mid-size silos is connected to a bulk item silo through conveyor belts.

The third type of silo is a FedEx drop-off point where the ordered items arrive to be packed. The public can also drop off their own pre-packed packages to be shipped out into the city. Having in-housing shipping cuts out a middle step of moving product out of the building to another distribution center before reaching the customer.

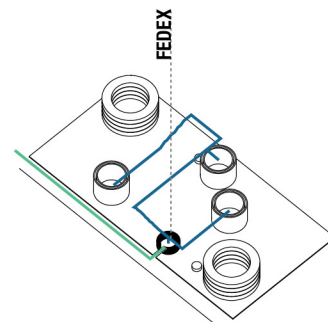
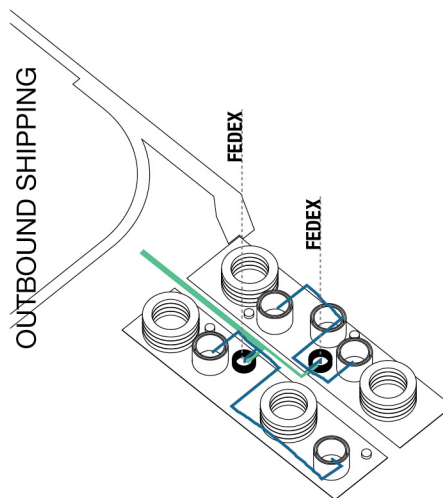
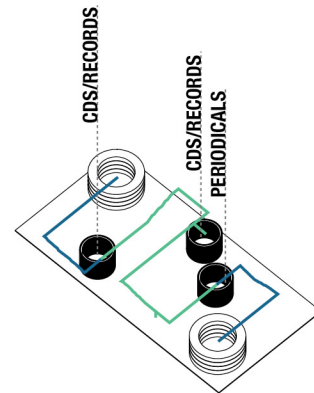
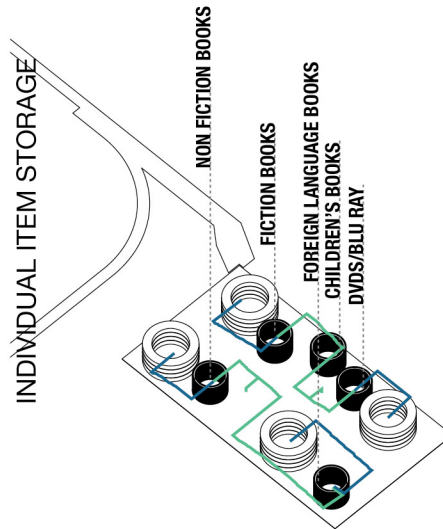
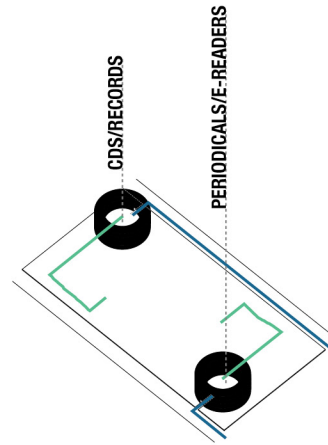
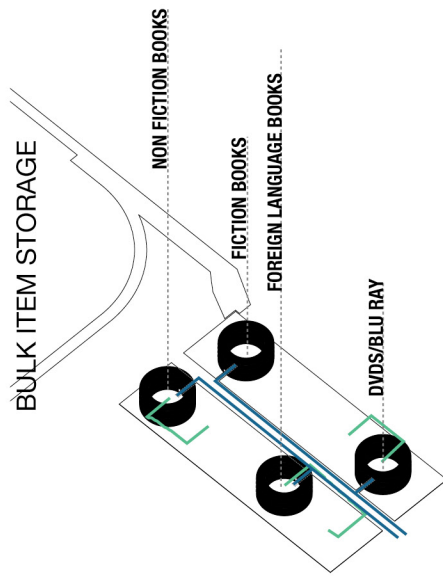
The silos separate the distribution logistics from the public but also allow for more intimately scaled public spaces within each of two larger silo types. Here, on raised floor plates, the public is most shielded from the exterior, able to escape the city.



The silos themselves are connected by conveyor systems which run along programmed “absorption” bars. These bars are public spaces with various programs from reading lounges to small theaters and individual listening stations. The program in these bars relates to the type of product stored in the silo intersecting the platform.

These raised spaces are semi-private, removed from the bustle on the main floor below. The silos connect and mediate between the bars above and the surface below. Stairs wrap around or within each silo giving access between levels.

The main floor, or “surface,” connects the city, the silos, and infrastructures. Acting as a large transfer station in the city, it takes advantage of the people already there and draws new people in. In the Farley building to the East, informal programs colonize the surface with a more bottom up strategy where small individual-run businesses can set up markets or larger events can occur. New access points to Penn Station are here as well, drawing people up into the building from the tracks below. In the Morgan building on the West, private meeting spaces are provided for travelers within the city or region.



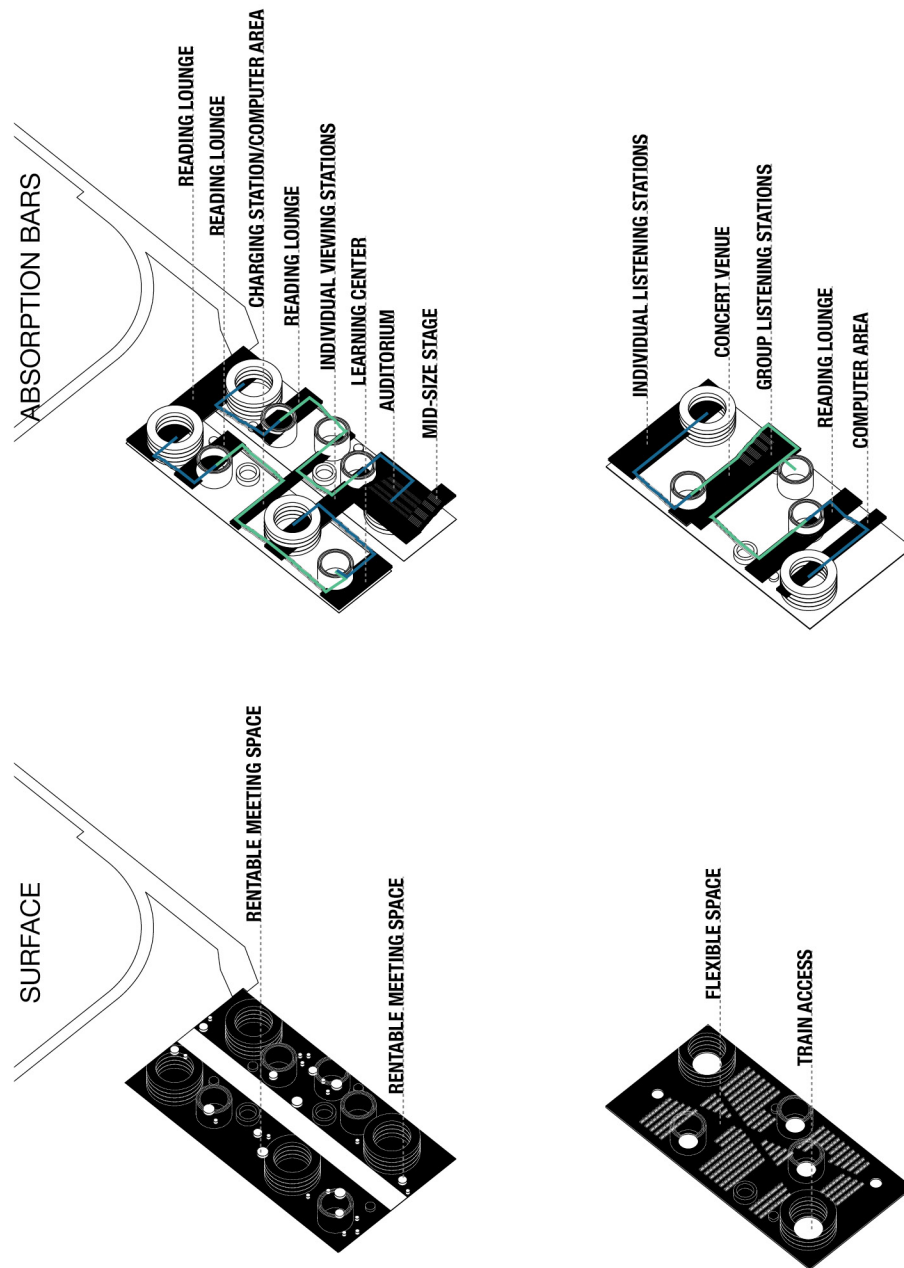


Fig. 25 Program Breakdown

**BULK ITEM SHELVING**  
**VERTICAL CIRCULATION**  
**TEMPORARY SHELVING/LOUNGE FLOOR**  
**PEDESTRIAN PATH**  
**INDIVIDUAL ITEMS OUTBOUND**  
**UNPACKING FLOOR**  
**VERTICAL CONVEYOR**  
**FORKLIFT PATH**  
**BULK ITEM OUTBOUND**  
**TRUCK LOADING**

Bulk items [still in shipping boxes] are off-loaded from the cargo truck directly into push-back storage shelving units. The forklift moves on a raised platform, giving the forklift operator the ability to unload from the truck and move items into shelving spots and from shelving rack back onto a truck or onto the central platforms where the boxes can be unpacked. Once unpacked, the products are placed on conveyor belts to move to the next silo type.

An inclosed staircase wraps around the exterior of the silo giving workers and the public access to the absorption bar and central platforms.

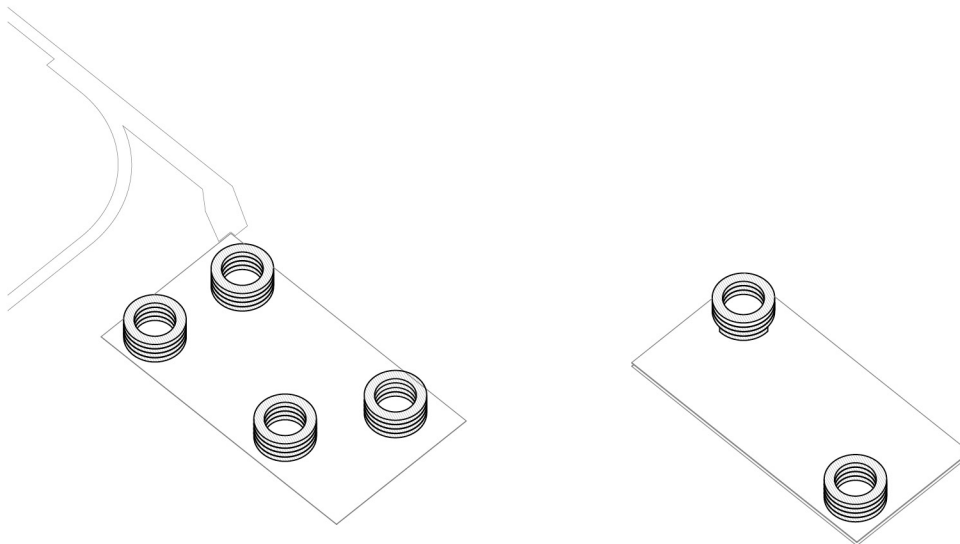


Fig. 26 Bulk Item Storage Location



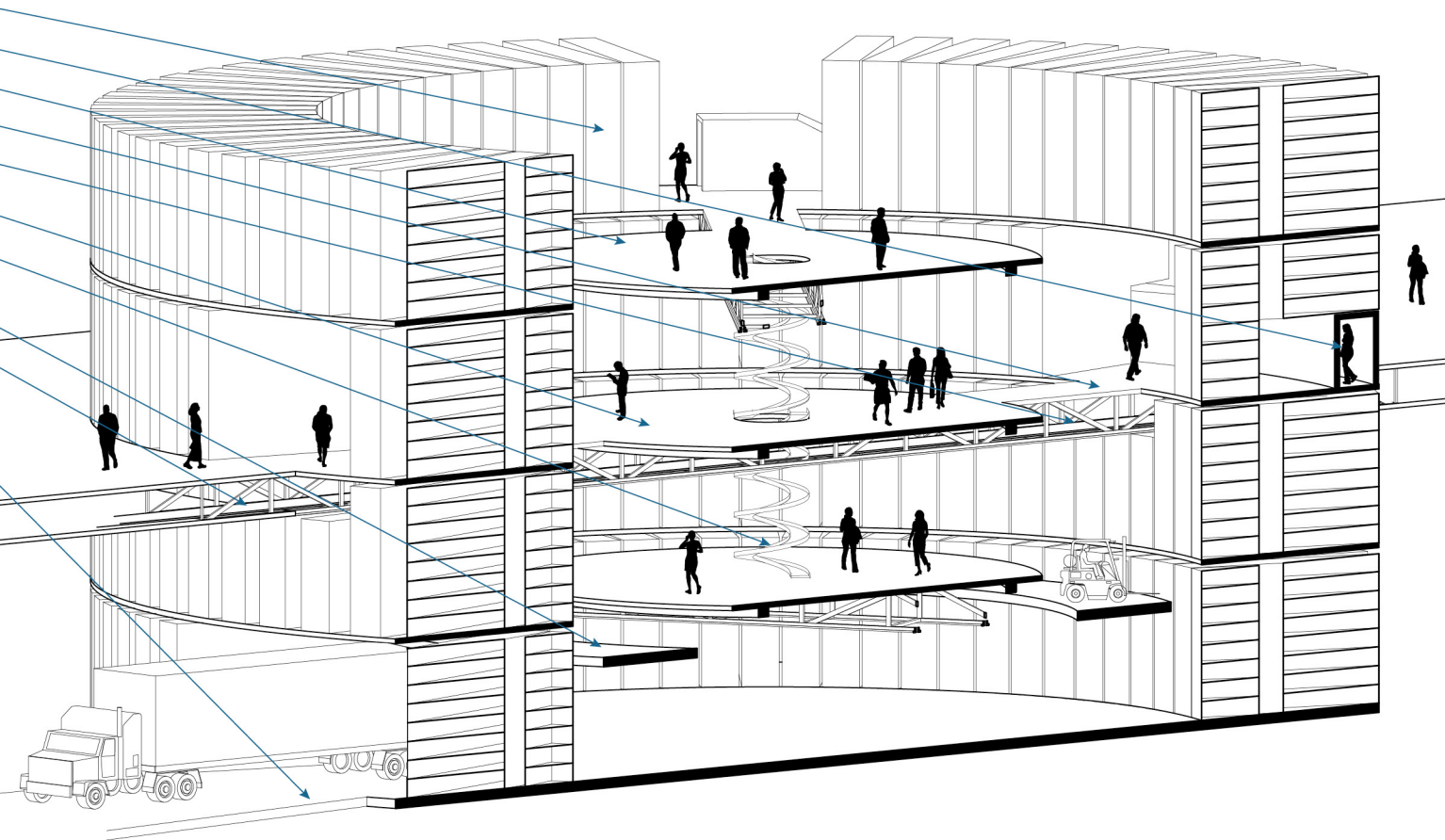


Fig. 27 Bulk Item Storage Detail Axonometric

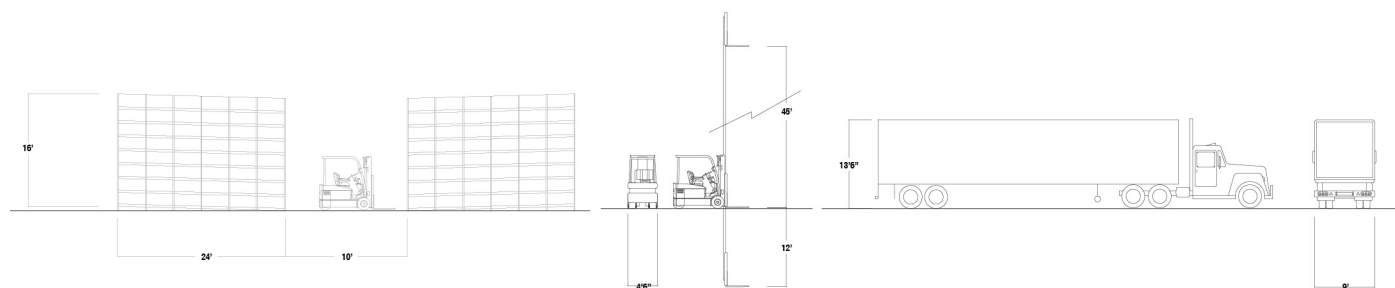


Fig. 28 Logistics: Push Back Pallet Rack Storage System, Forklift and Semi-truck Dimensions

INDIVIDUAL ITEM SHELVING  
 SORTING / LOUNGE FLOOR  
 INDIVIDUAL ITEMS OUTBOUND  
 PEDESTRIAN PATH  
 VERTICAL CONVEYOR  
 OUTBOUND PROCESSING FLOOR  
 VERTICAL CIRCULATION  
 FORKLIFT TRACK  
 INDIVIDUAL ITEMS INBOUND

Unpacked items come into the mid-size silo on conveyor belts where they are unloaded onto the central platforms and sorted for shelving. The items are moved to the edge on carts where the order picker loads the cart, for employees to shelve the times. The two layers of high density shelving create an isolated track for the order picker to drive around. The reverse process occurs when items are ordered to be shipped out or requested by a customer in-store.

An interior staircase spirals up inside the silo giving workers and the public access to the absorption bar and central platforms. The public can access items located within reach of the stairs and platform landings.

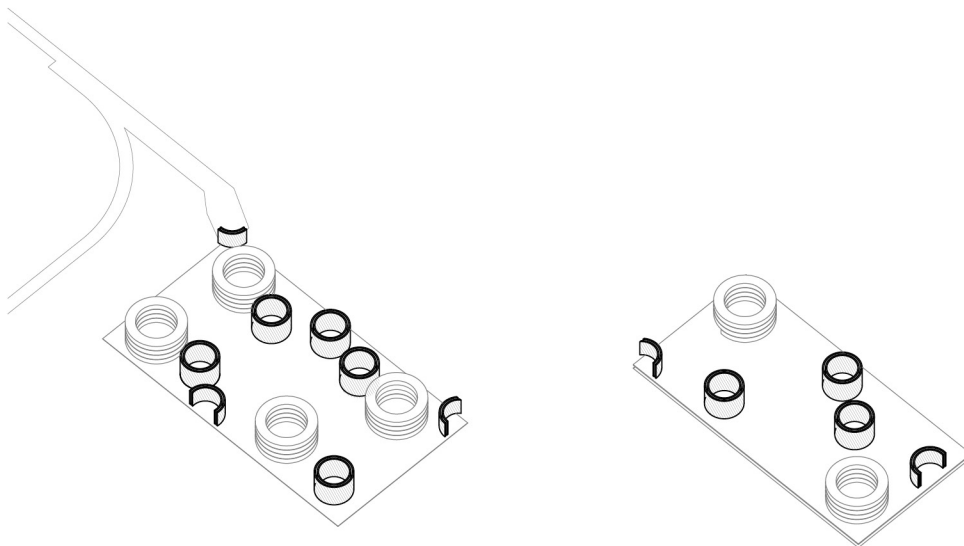


Fig. 29 Loose Item Storage Location

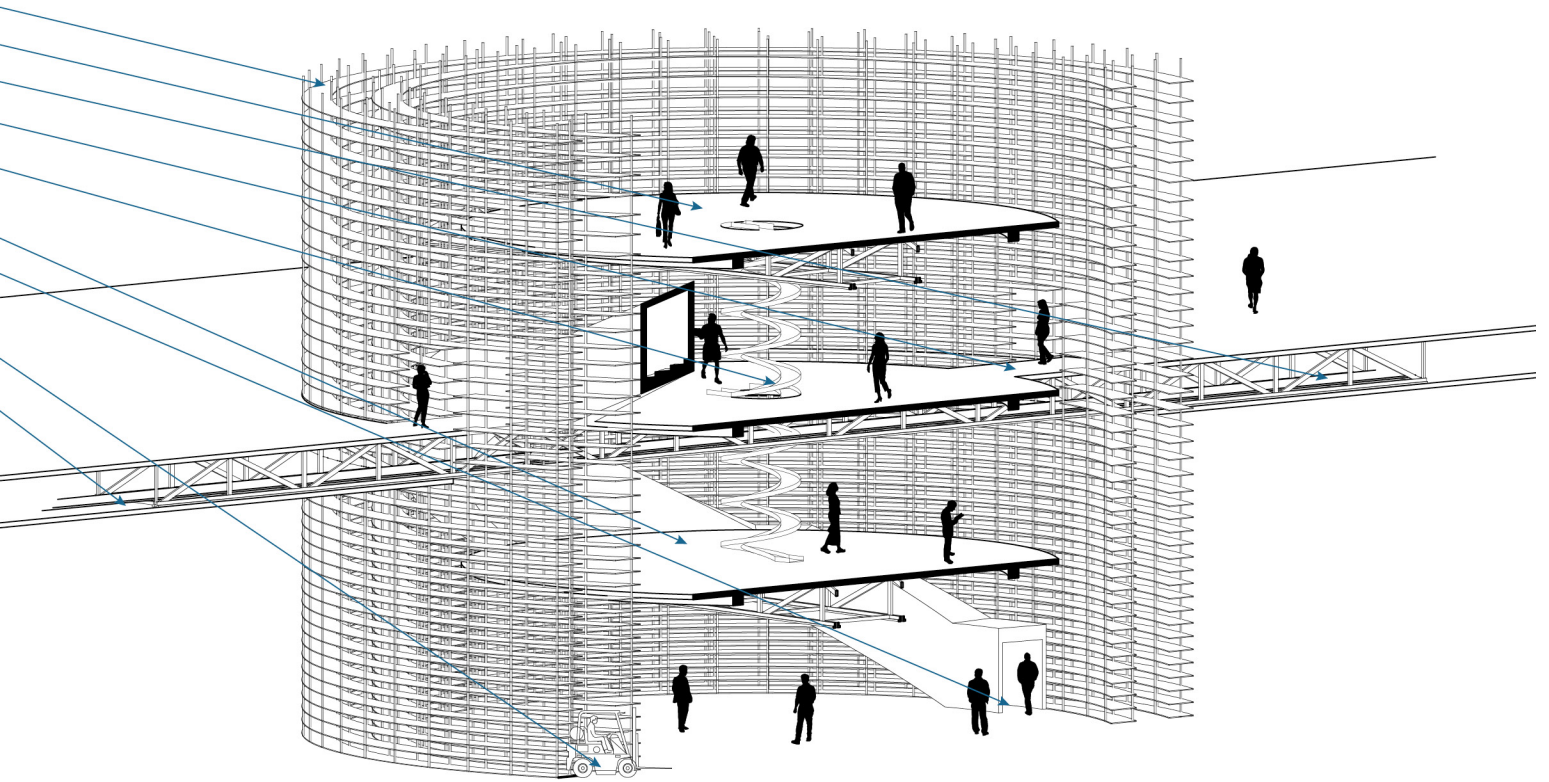


Fig. 30 Loose Item Storage Detail Axonometric

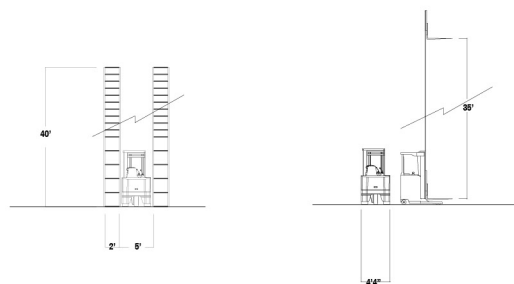


Fig. 31 Logistics: Metal Shelving Storage System, Order Picker Dimensions

PACKAGE STORAGE  
 INDIVIDUAL ITEMS INBOUND  
 VERTICAL SORTING CONVEYOR  
 COLLECTION AND PACKAGING BINS  
 PEDESTRIAN PATH  
 FORKLIFT LOADING FLOOR  
 ENTRANCE POINT  
 PUBLIC DROP OFF POINT  
 TRUCK LOADING DOCK

Items ordered to be shipped out to customers move to the outbound shipping silo where they are sorted by order, packaged, labeled, and moved by forklift to the push back-shelving spaces and onto outbound trucks. At ground level there is a customer service area where the public can drop off packages to be shipped.

Items to be shipped within the city will go directly out to customers, while packages going a greater distance will be taken to a larger shipping processing center.

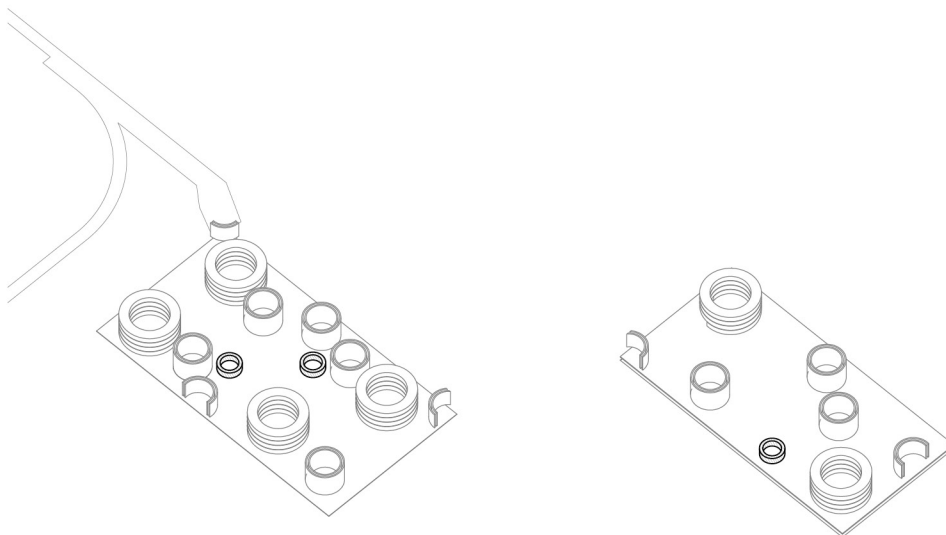


Fig. 32 Outbound Item Storage Location



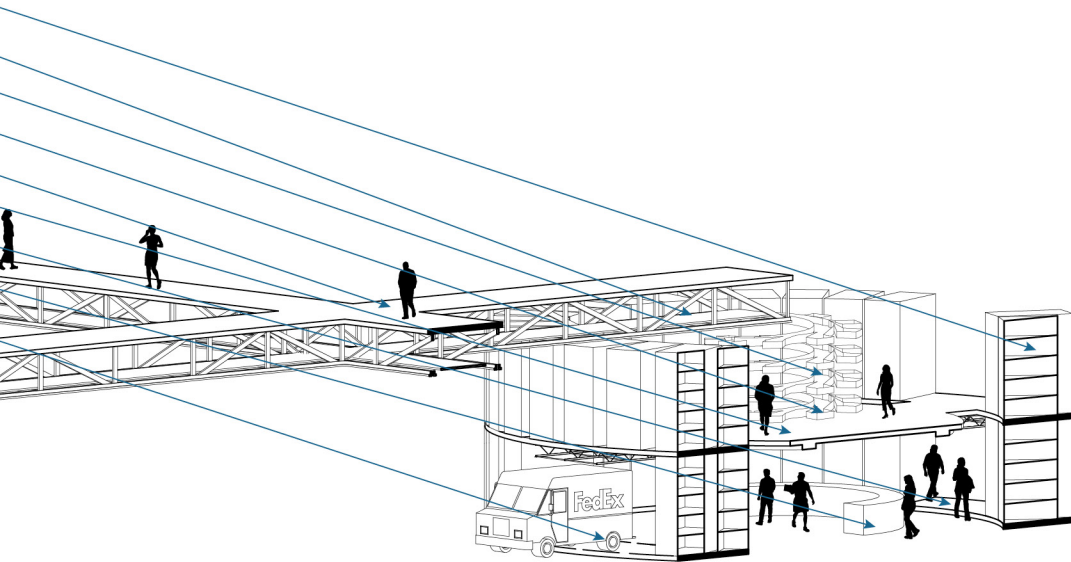


Fig. 33 Outbound Item Storage Detail Axonometric

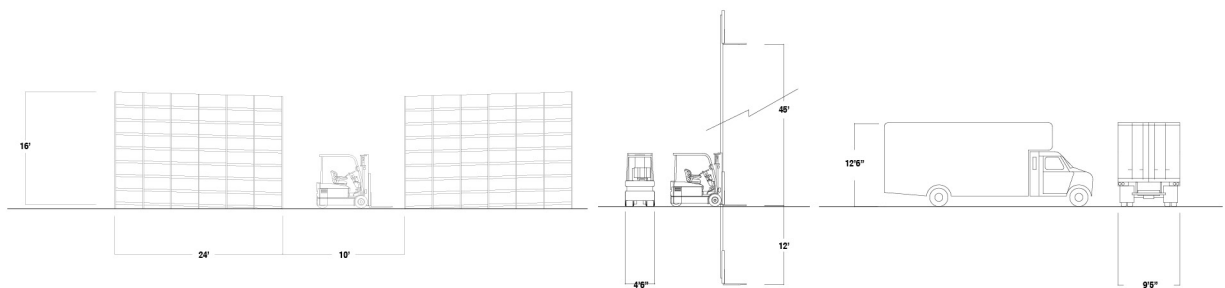
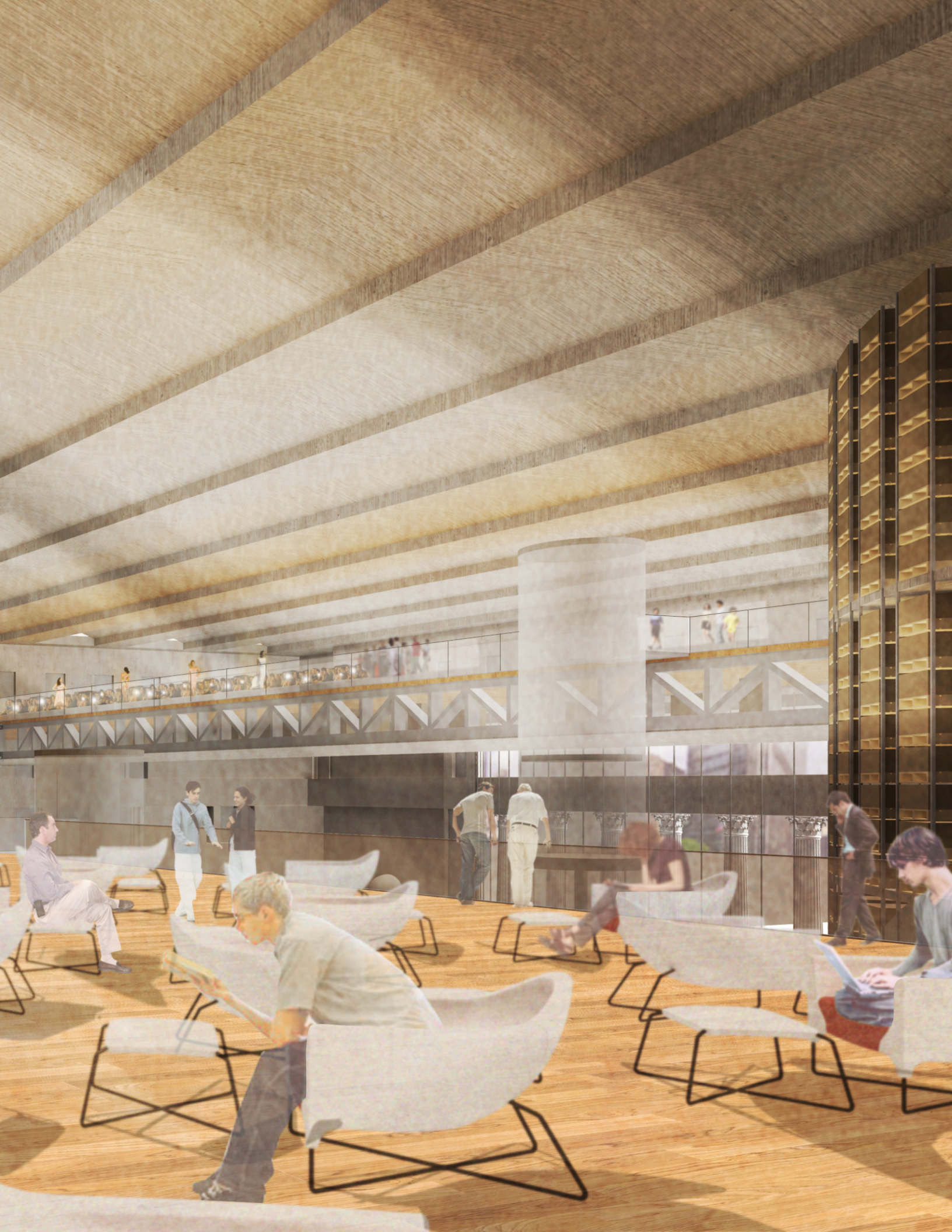


Fig. 34 Logistics: Push Back Pallet Rack Storage System, Forklift and Delivery Truck Dimensions

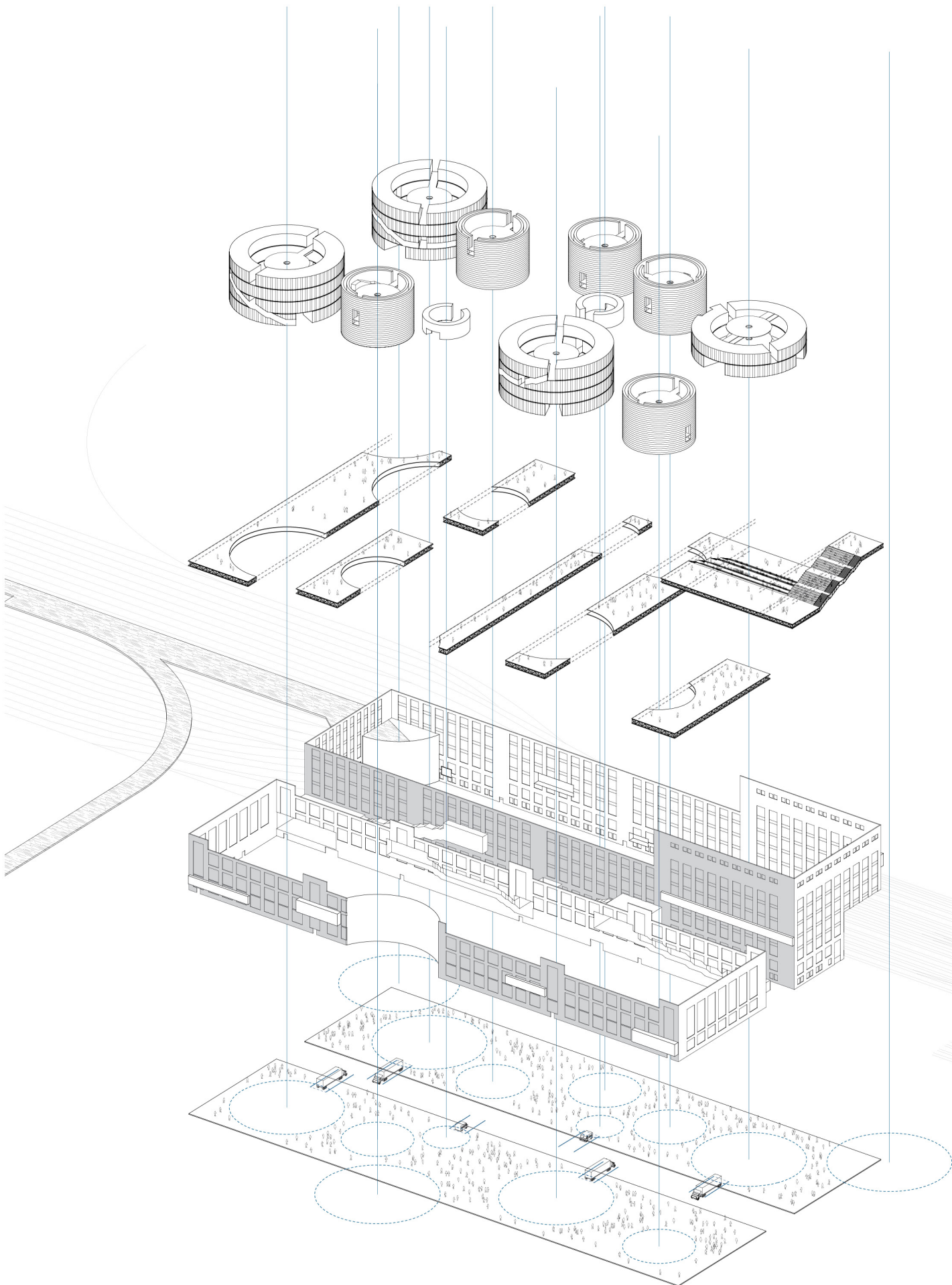












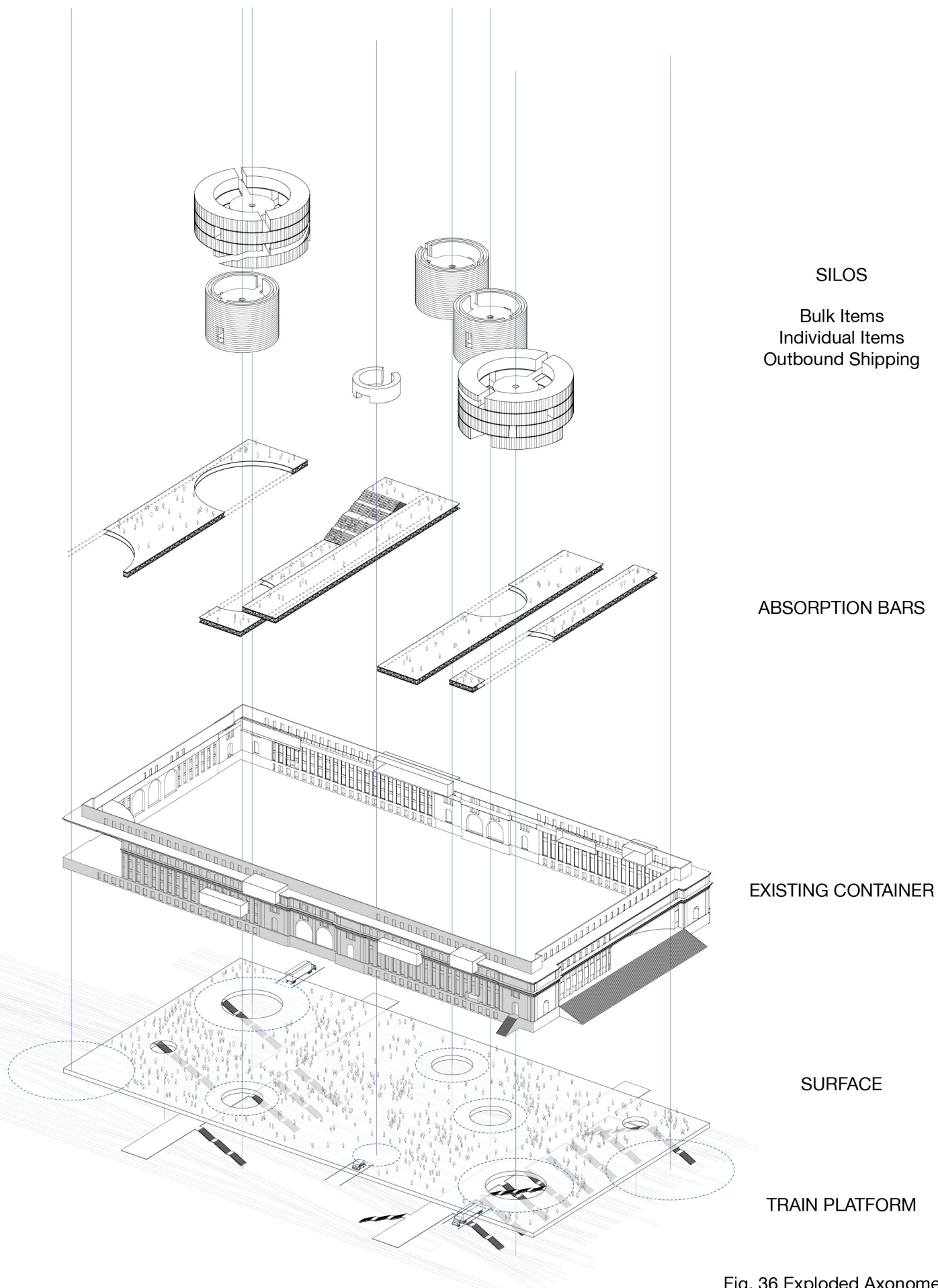
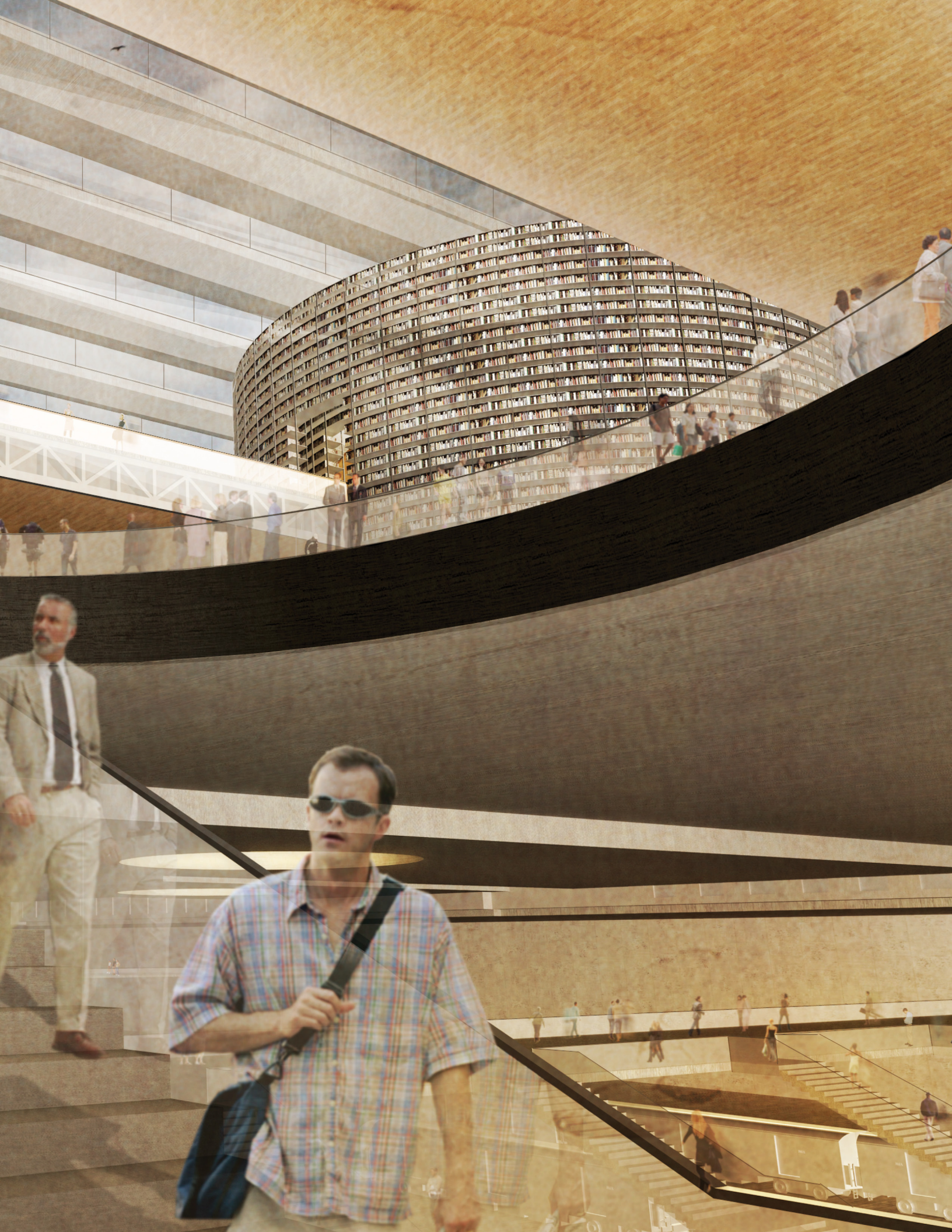


Fig. 36 Exploded Axonometric











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## USE

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Used year round for markets and meeting, the main surface will have its peak use at times during the year when events such as New York Fashion Week or the New York Film Festival will rent space. High shopping and travel days will increase use, as will extremes in weather when people will use the building as a short cut through the city.

The silos and “absorption” bars are the new program inserted into the existing monumental post office buildings. Circular openings are cut into the façade at five key entrance points letting in light and giving the passerby glimpses of the interior. The “absorption” bars extend beyond the envelope giving the occupants a view up and down the city streets.

Different paths are set up through the building to create different types of experiences for the visitor. Direct paths cut through the building on the main surface. While more circuitous routes weave across on the upper floors connecting the “absorption” bars. Elevators and stairs connect the “absorption” bars and main surface at multiple points creating an array of circulation options throughout.

Various types of users move through the building: there is the commuter who rushes across to get from the High Line to Penn station; the shopper with the intent to buy items from the market or off the storage shelves; the meanderer, walking through the city and building, using computers, listening to music, and potentially buying something; and the destination user, going to the building with a purpose to study, see a concert, or watch a film. Each type of person can coexist in this space, interacting with each other through direct communication, shared space, or information exchange.

This logistical landscape is a new type of public space where people can meet, gather, linger, or pass through tying together the city with new flows and monumentalizing the otherwise despatial exchange market.

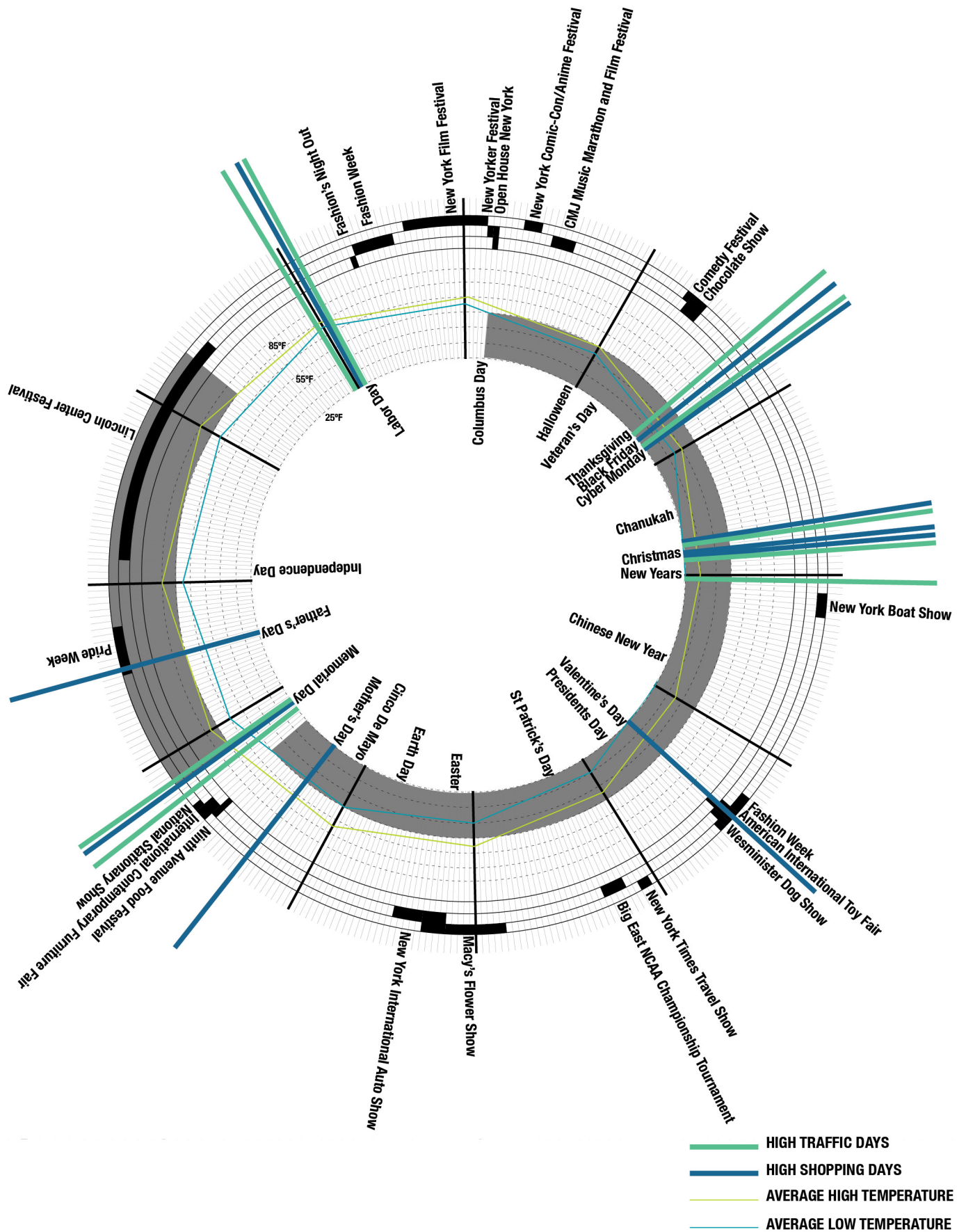
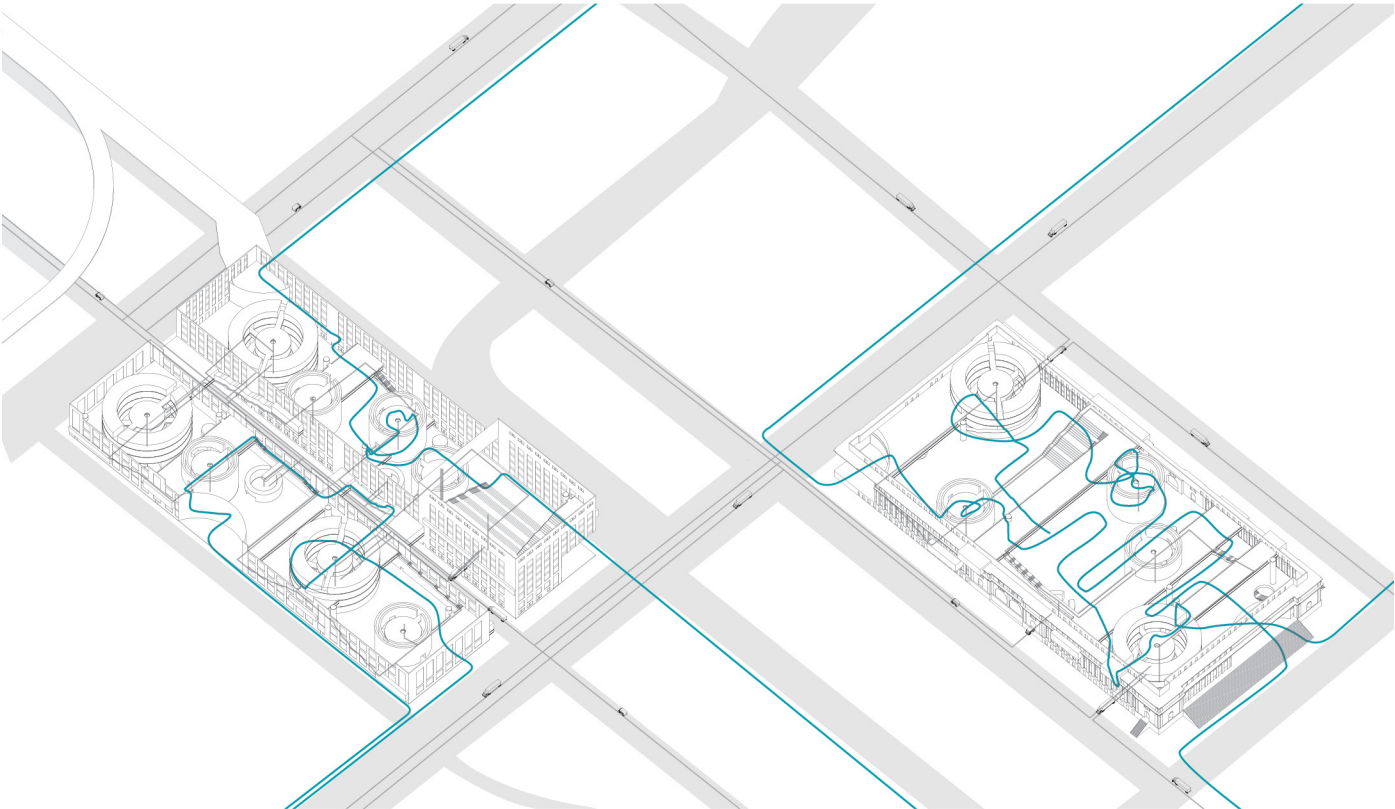
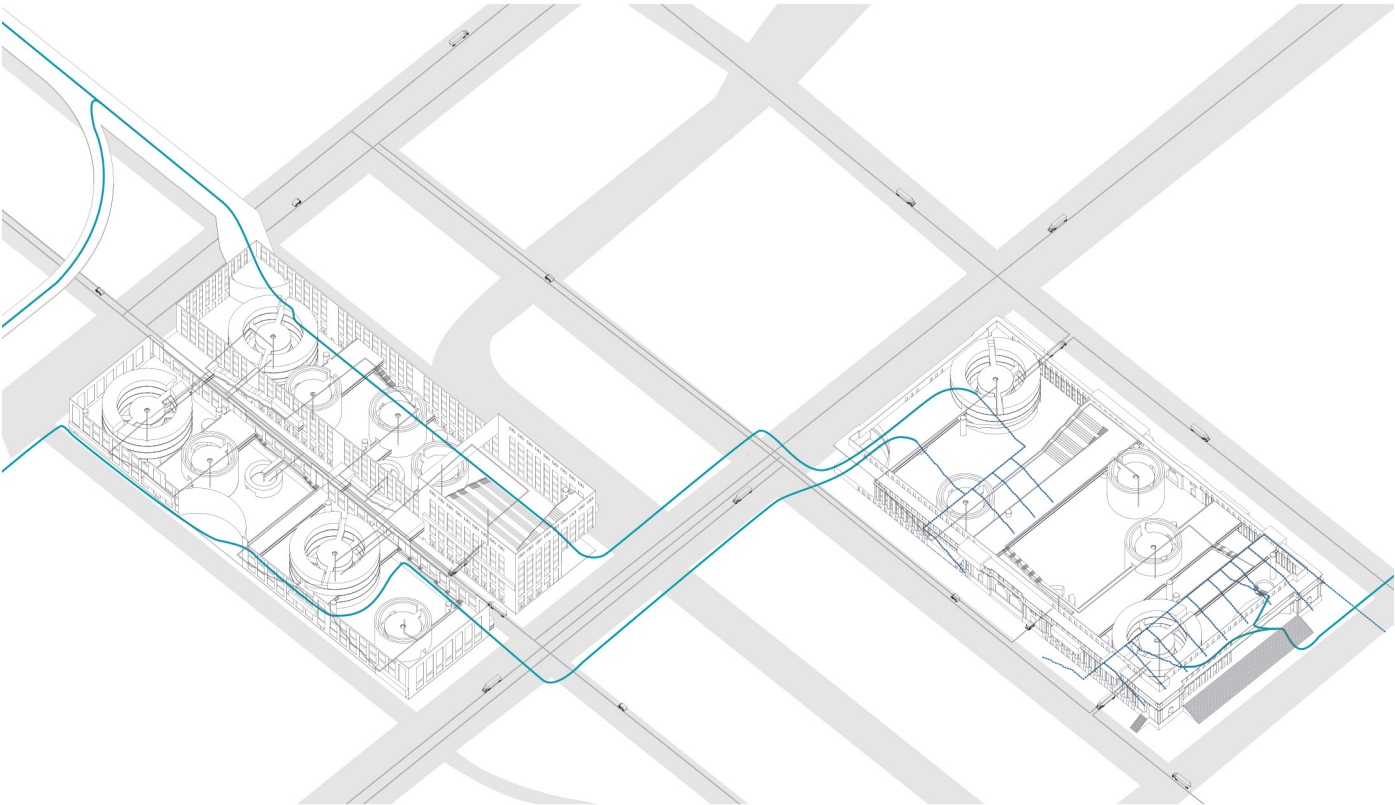


Fig. 38 Building Peak Use

USER FLOWS THROUGH SITE

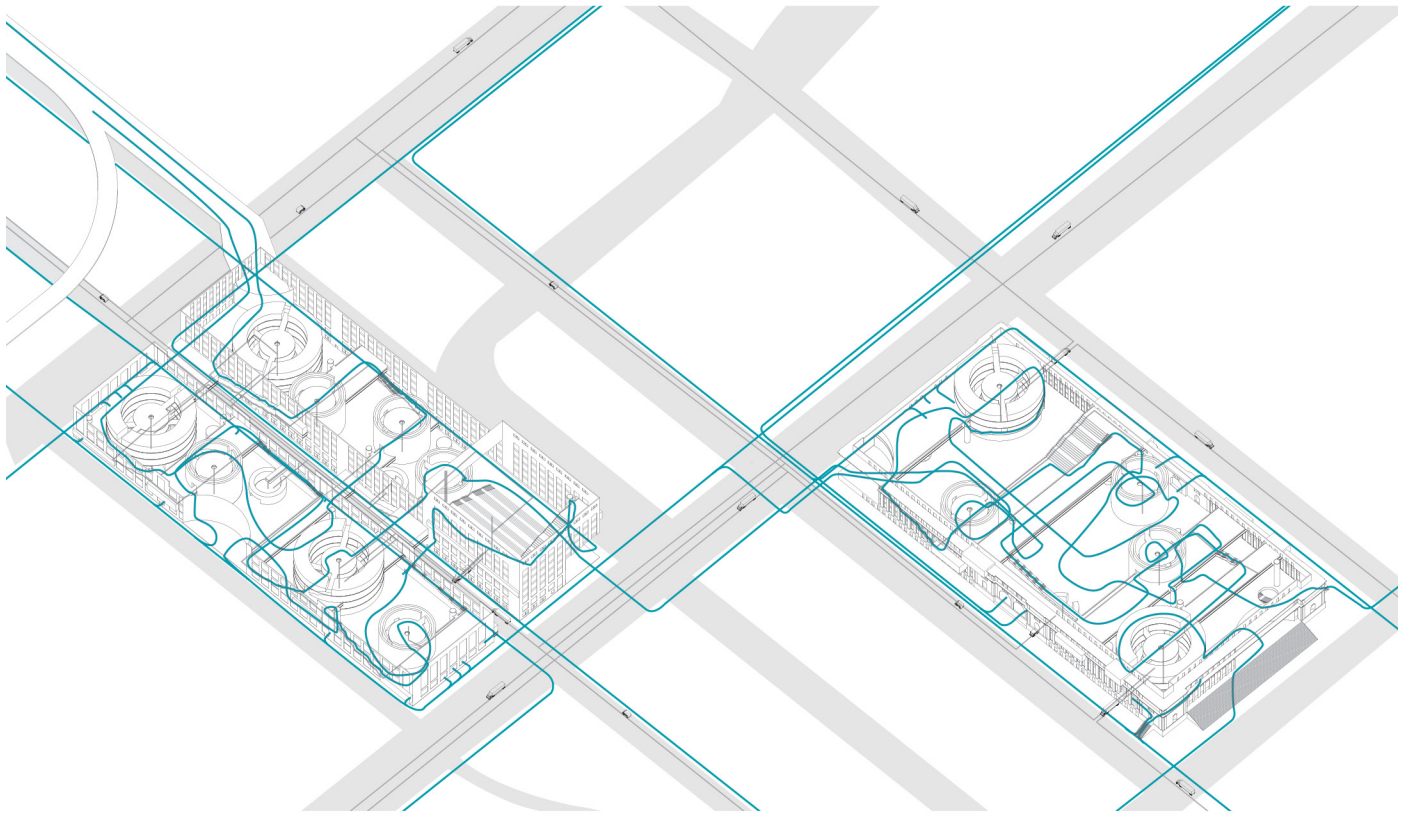


DESTINATION SHOPPER

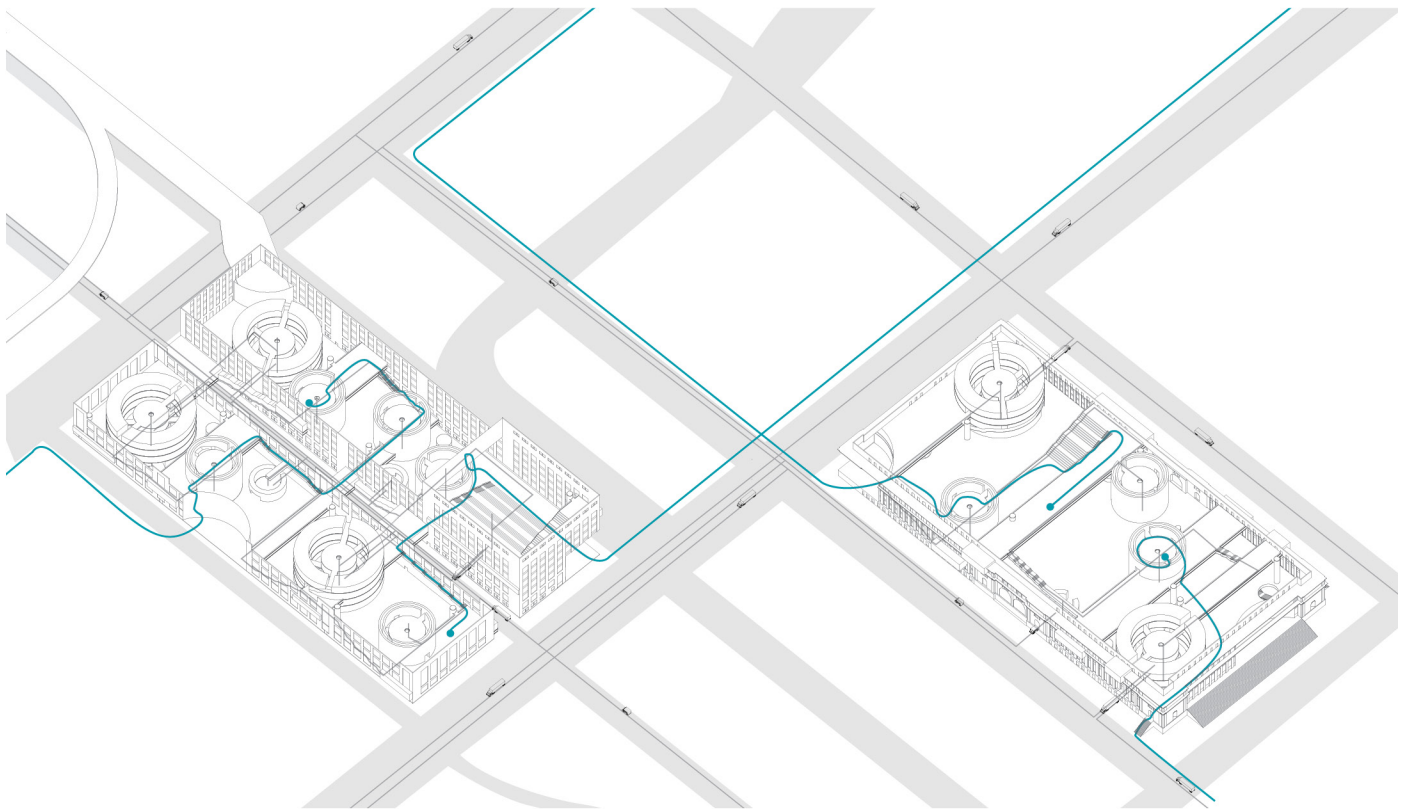


COMMUTER





MEANDERER



DESTINATION USER

Fig. 39 User Flows Through the Site







Fig. 41  
Section AA: Farley Building

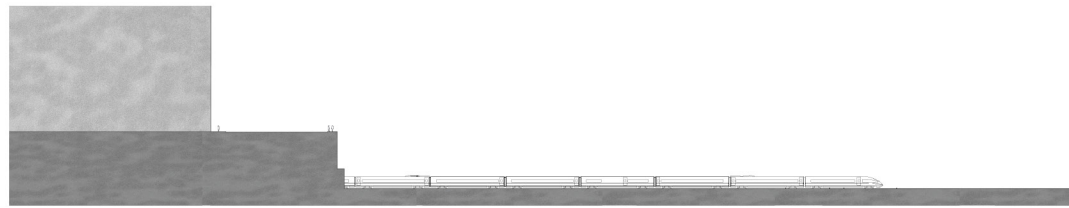


Fig. 42  
Floor Plan: Ground

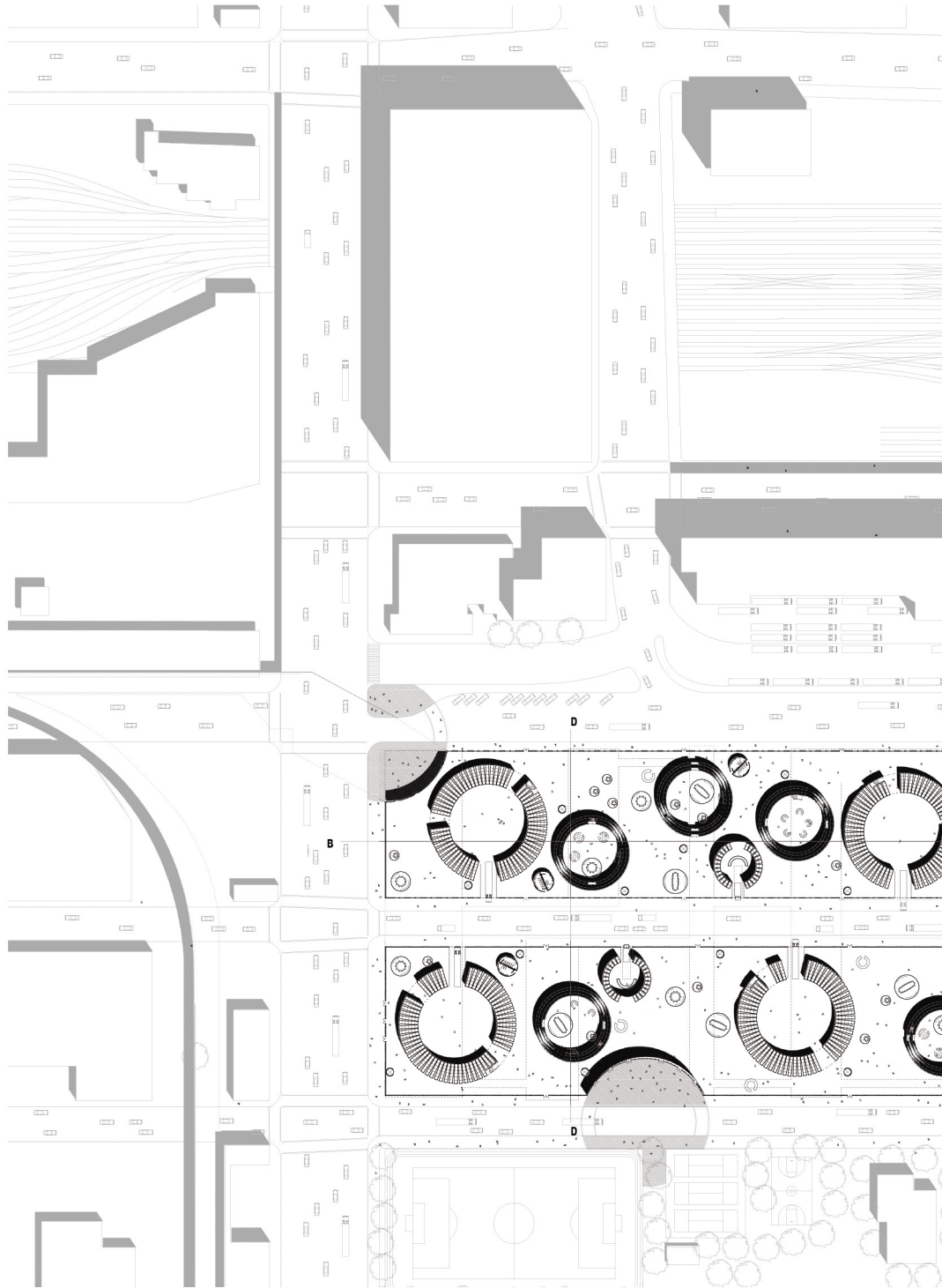
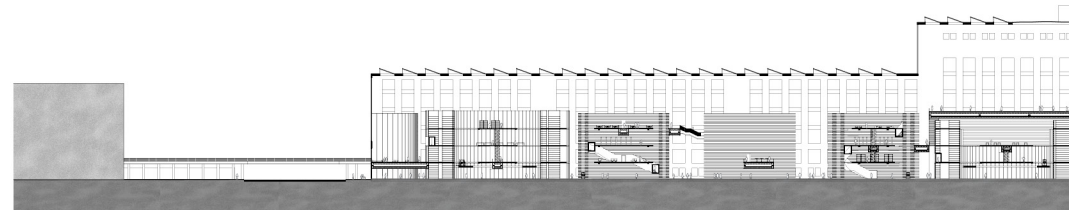
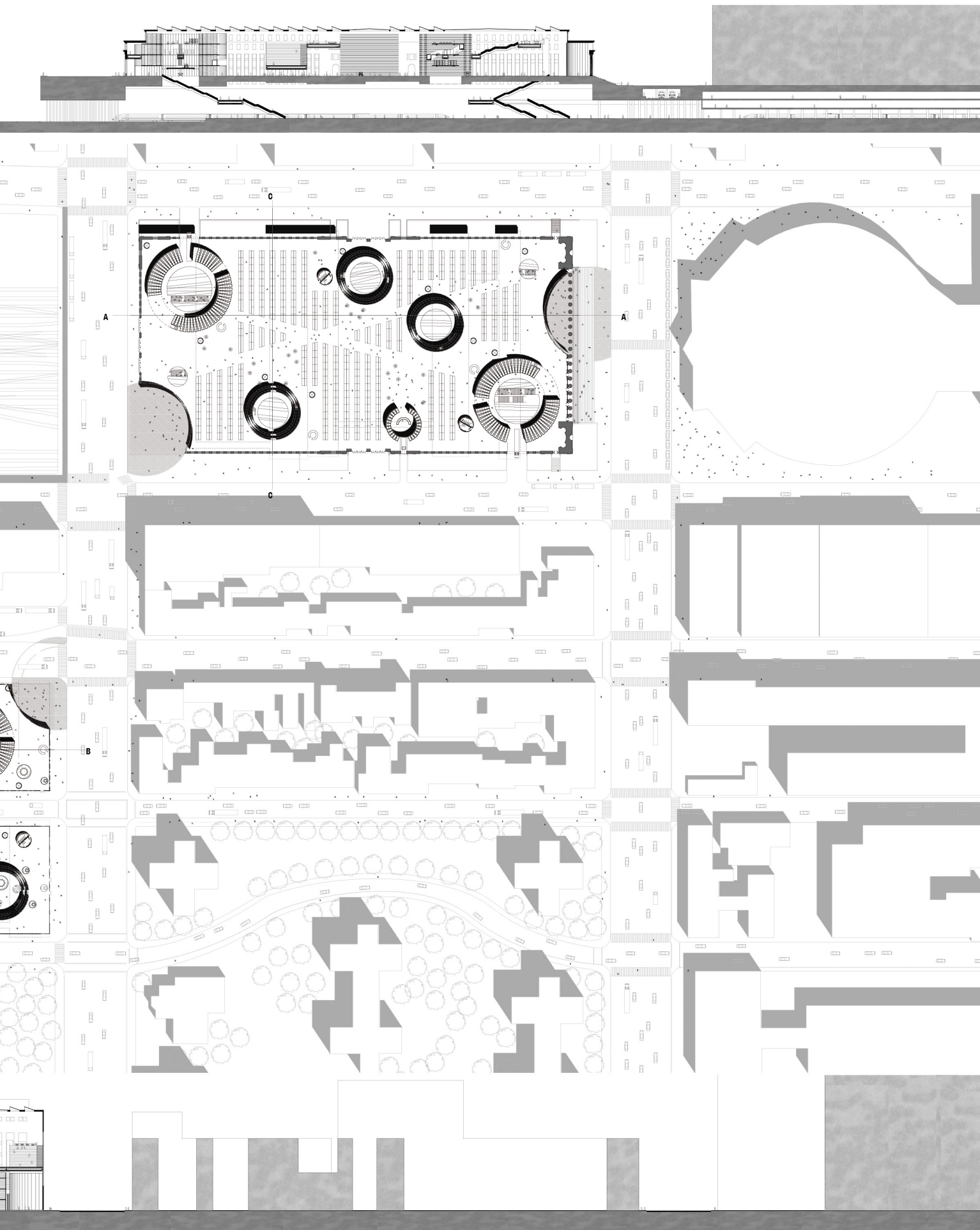
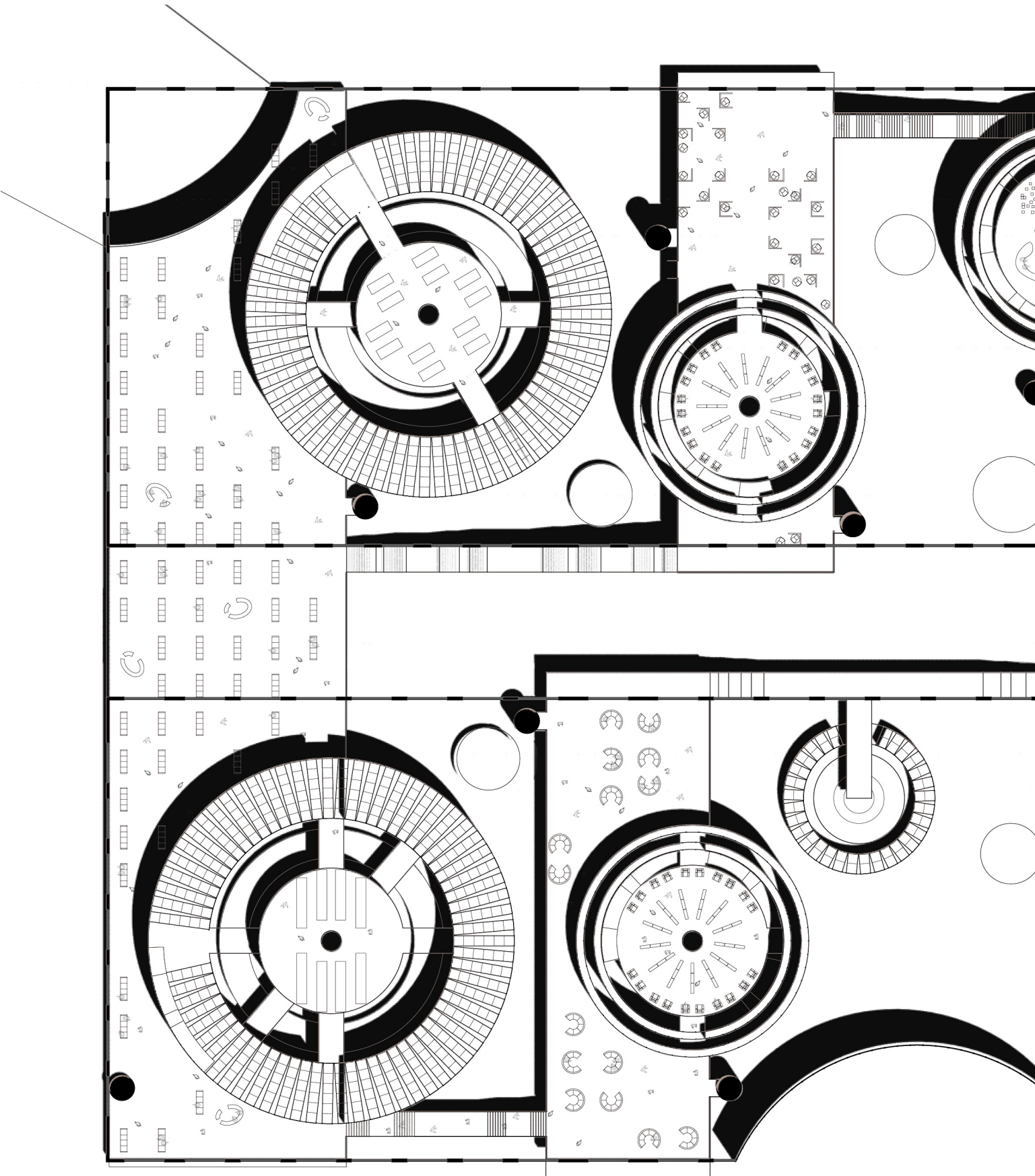


Fig. 43  
Section BB: Morgan Building









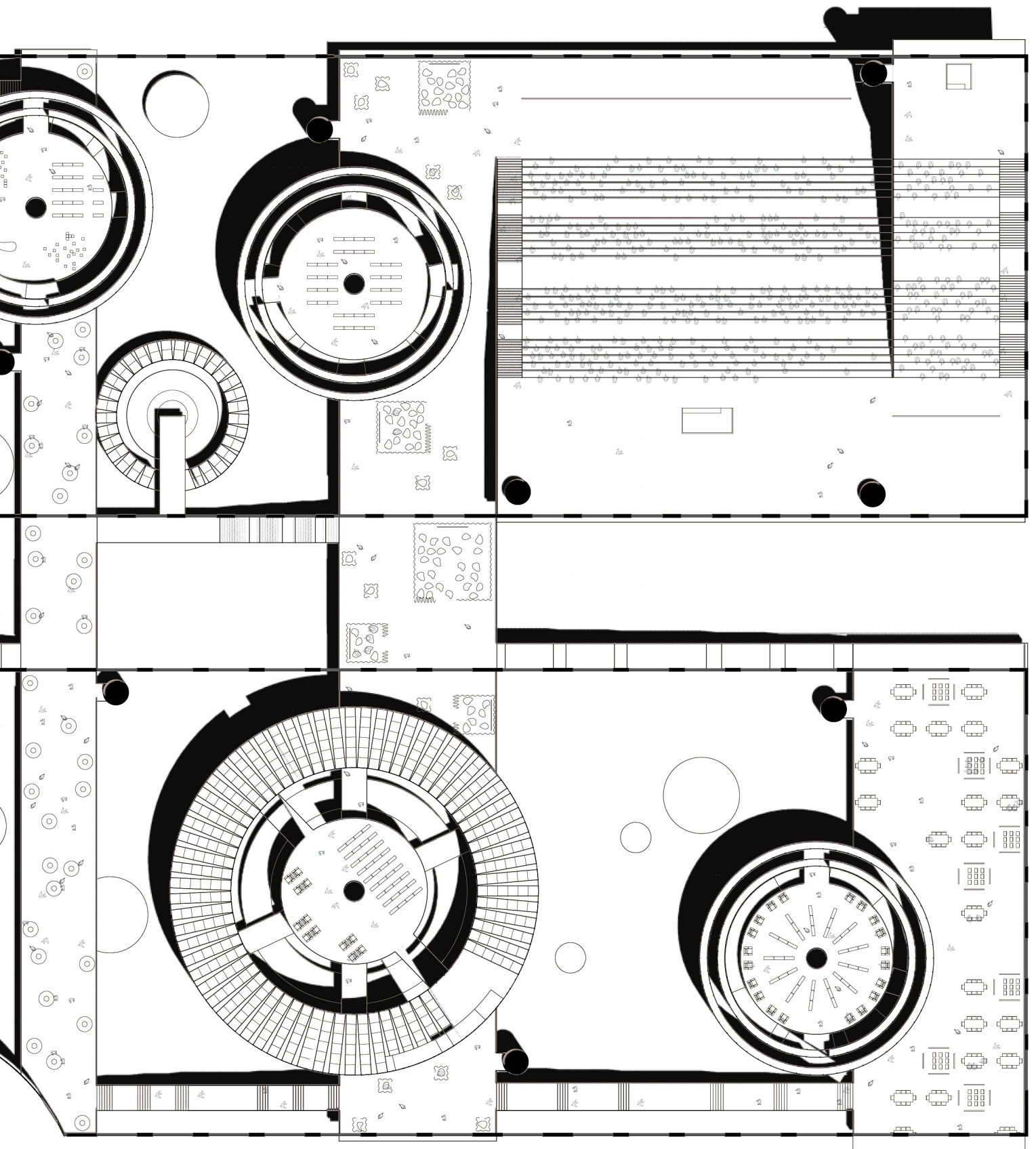
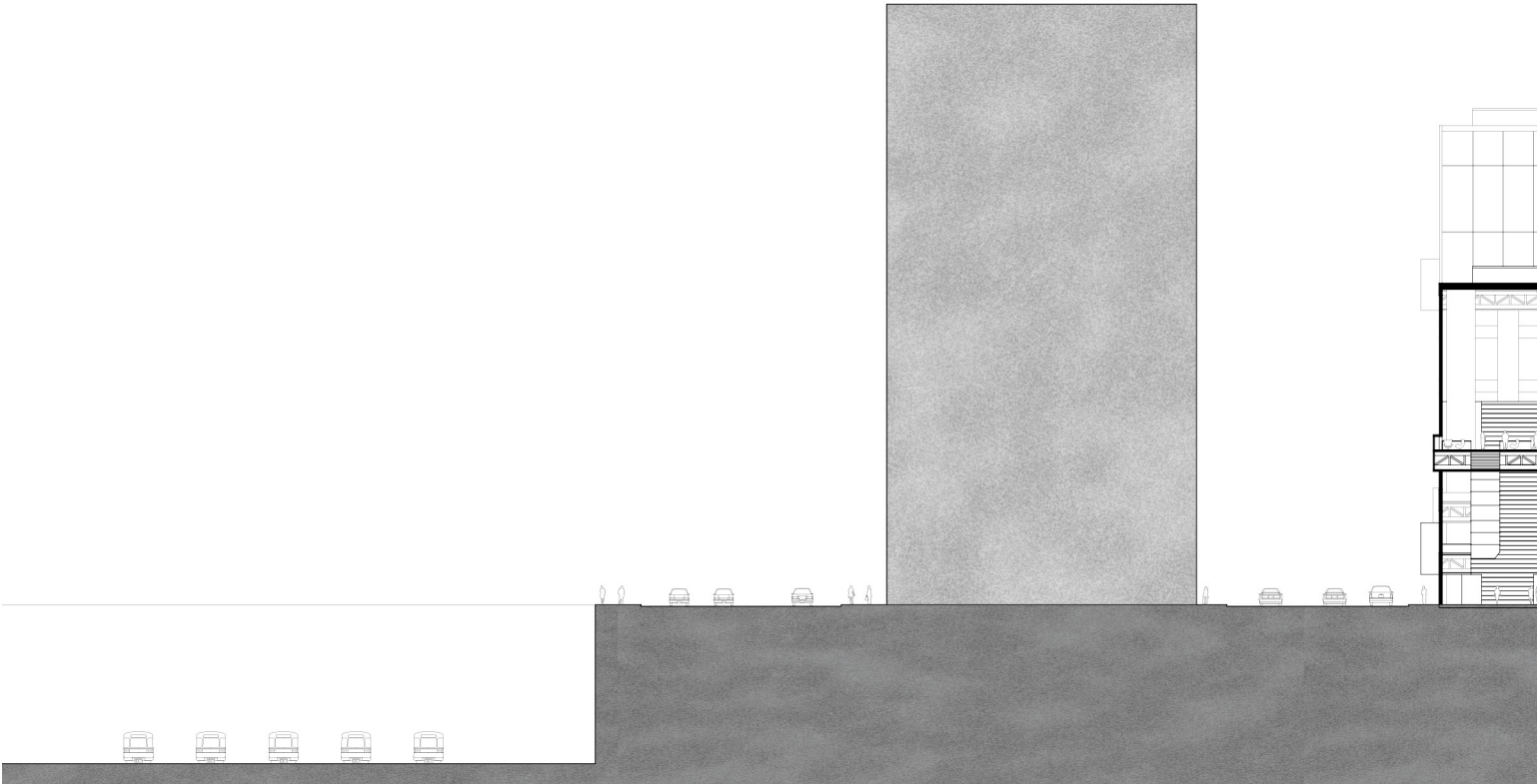
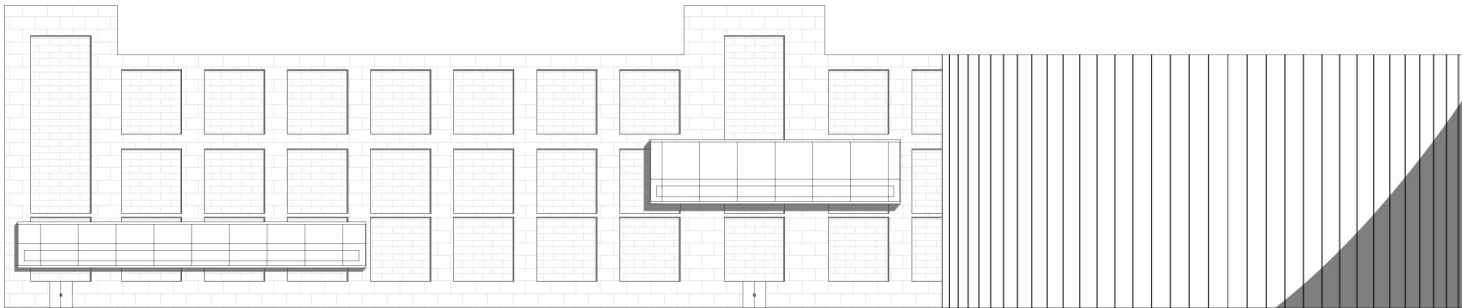
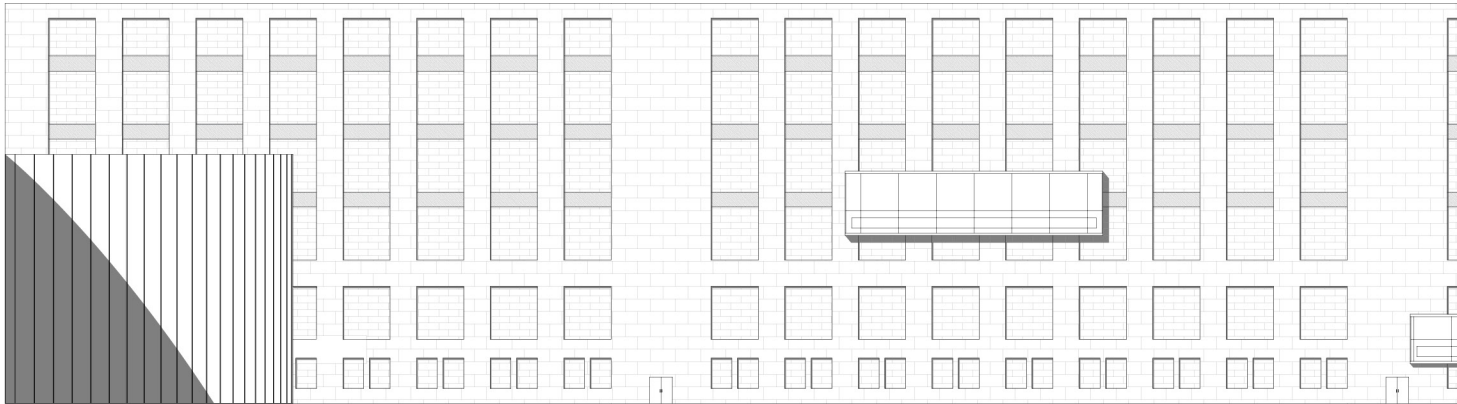


Fig. 44 Under Roof Plan: Morgan Building

MORGAN BUILDING





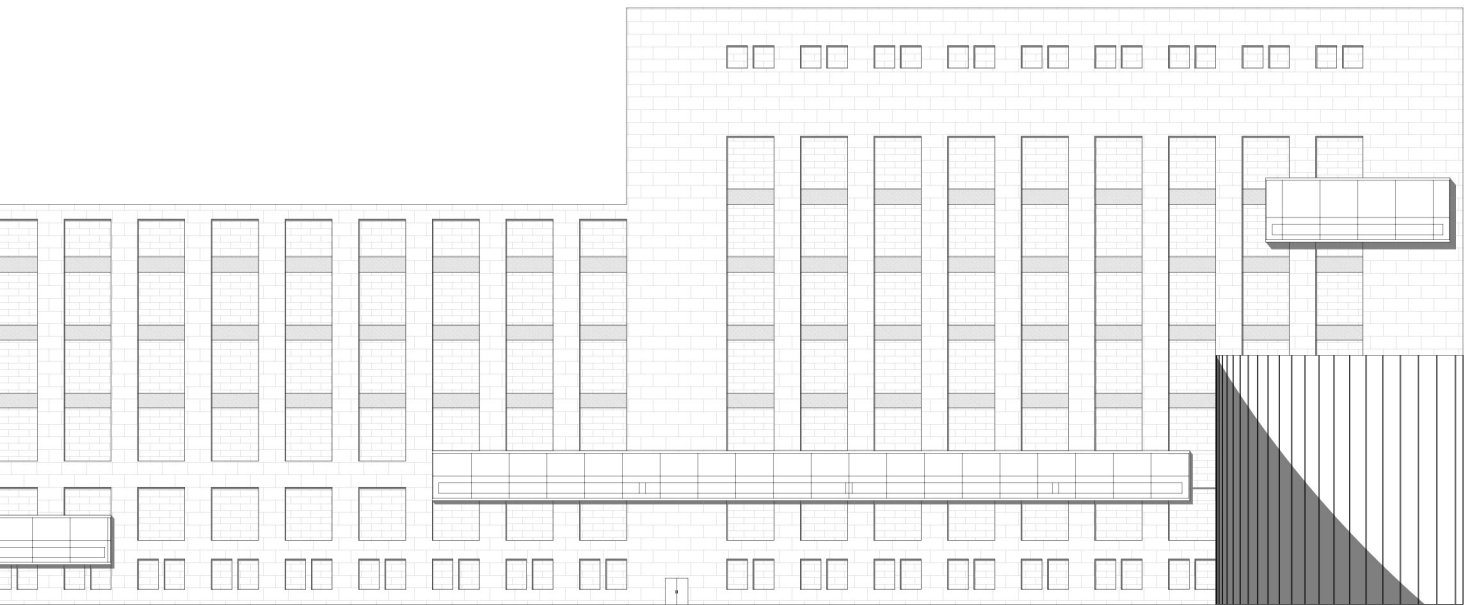


Fig. 45 North Elevation: Morgan Building

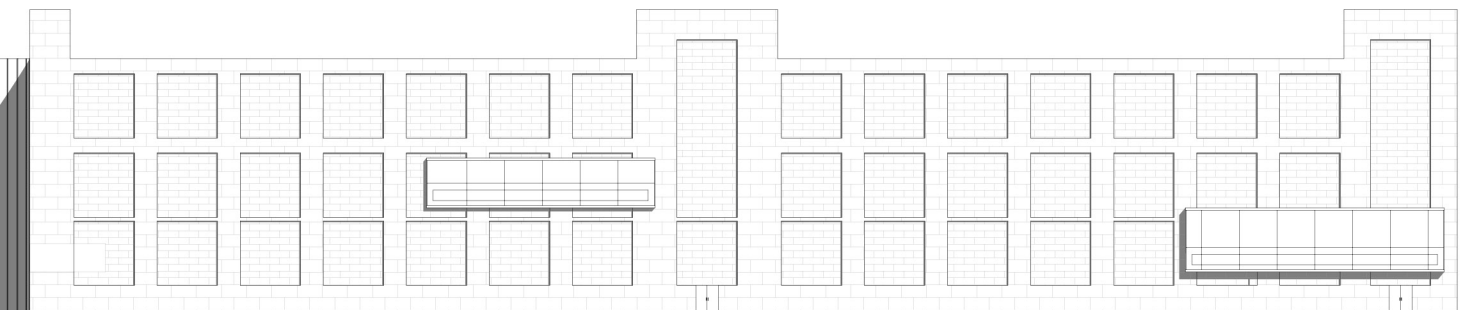


Fig. 46 South Elevation: Morgan Building

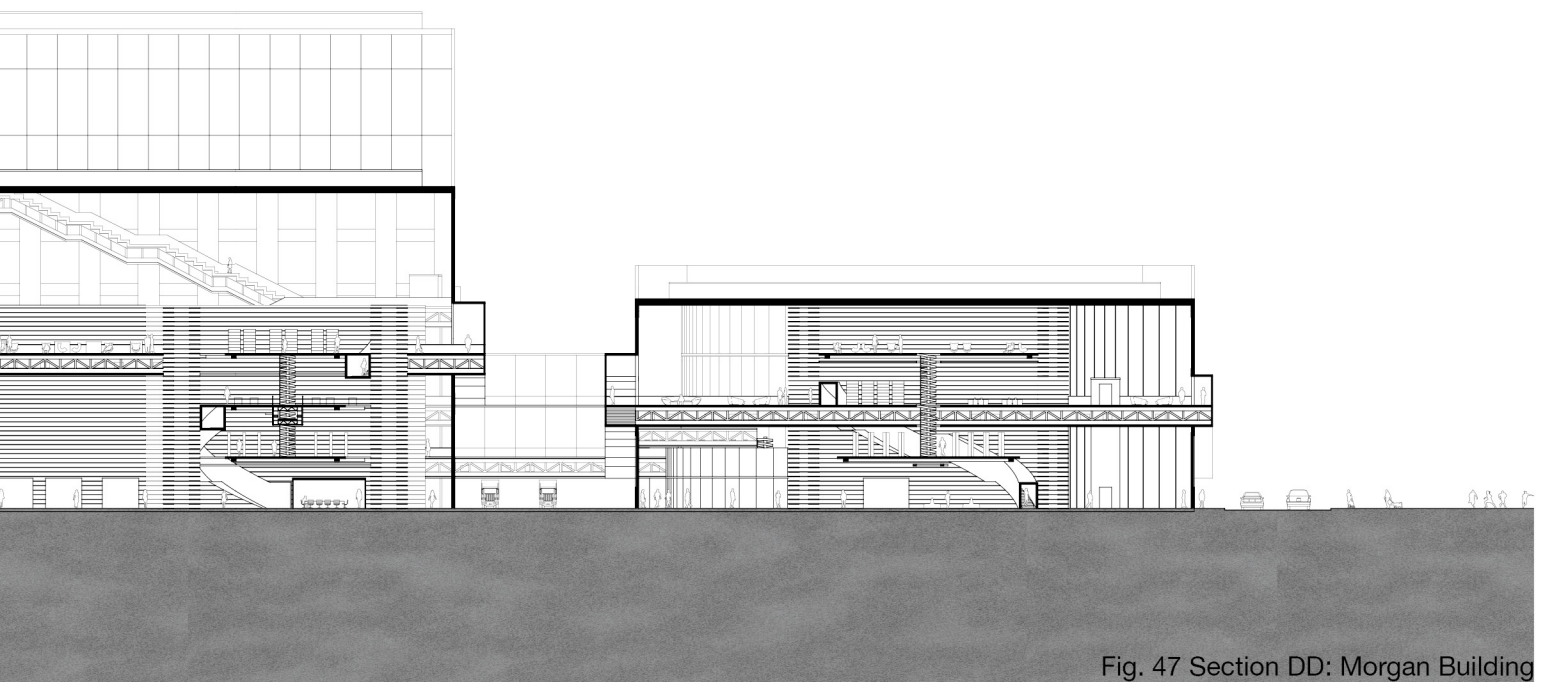
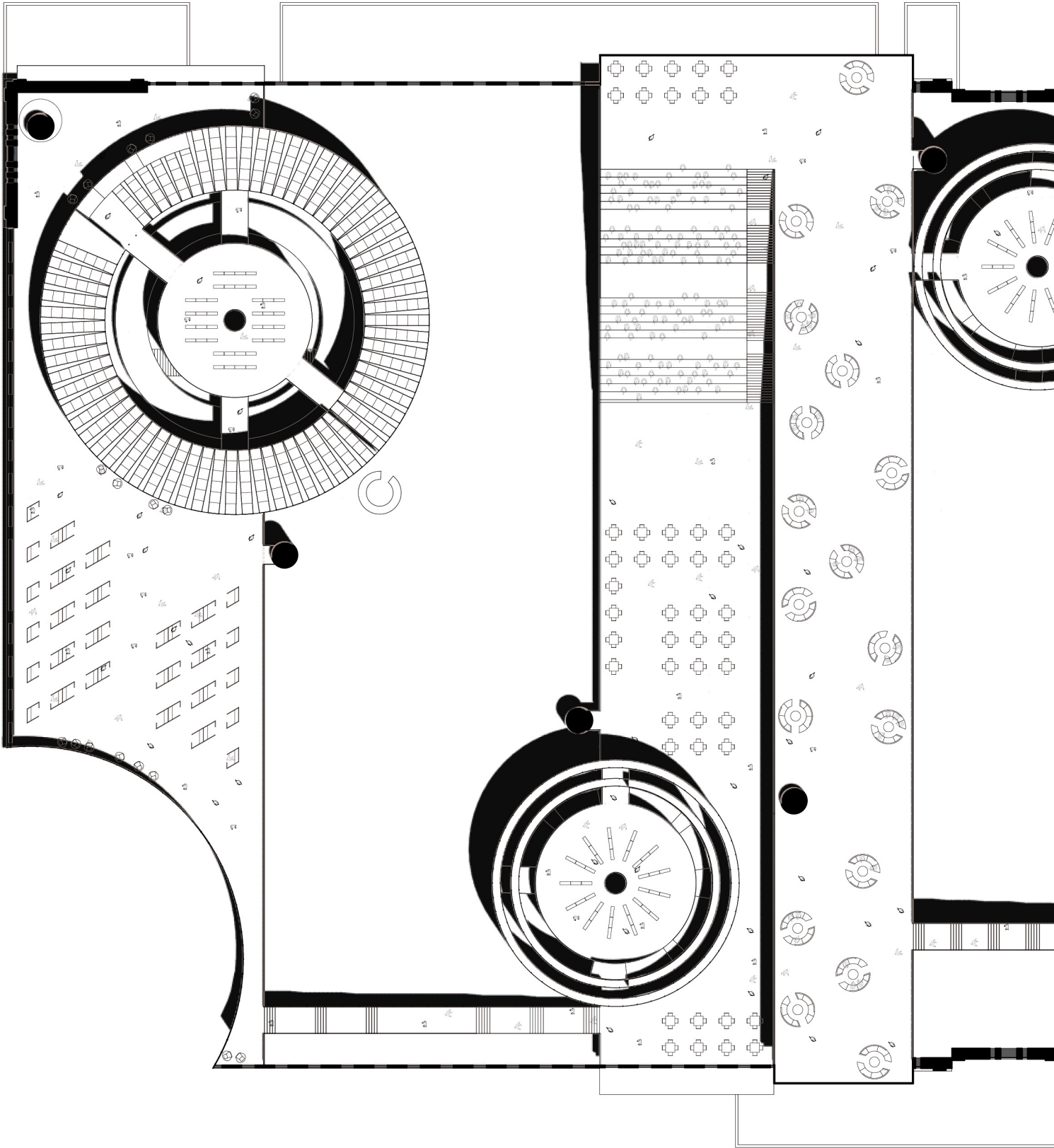


Fig. 47 Section DD: Morgan Building





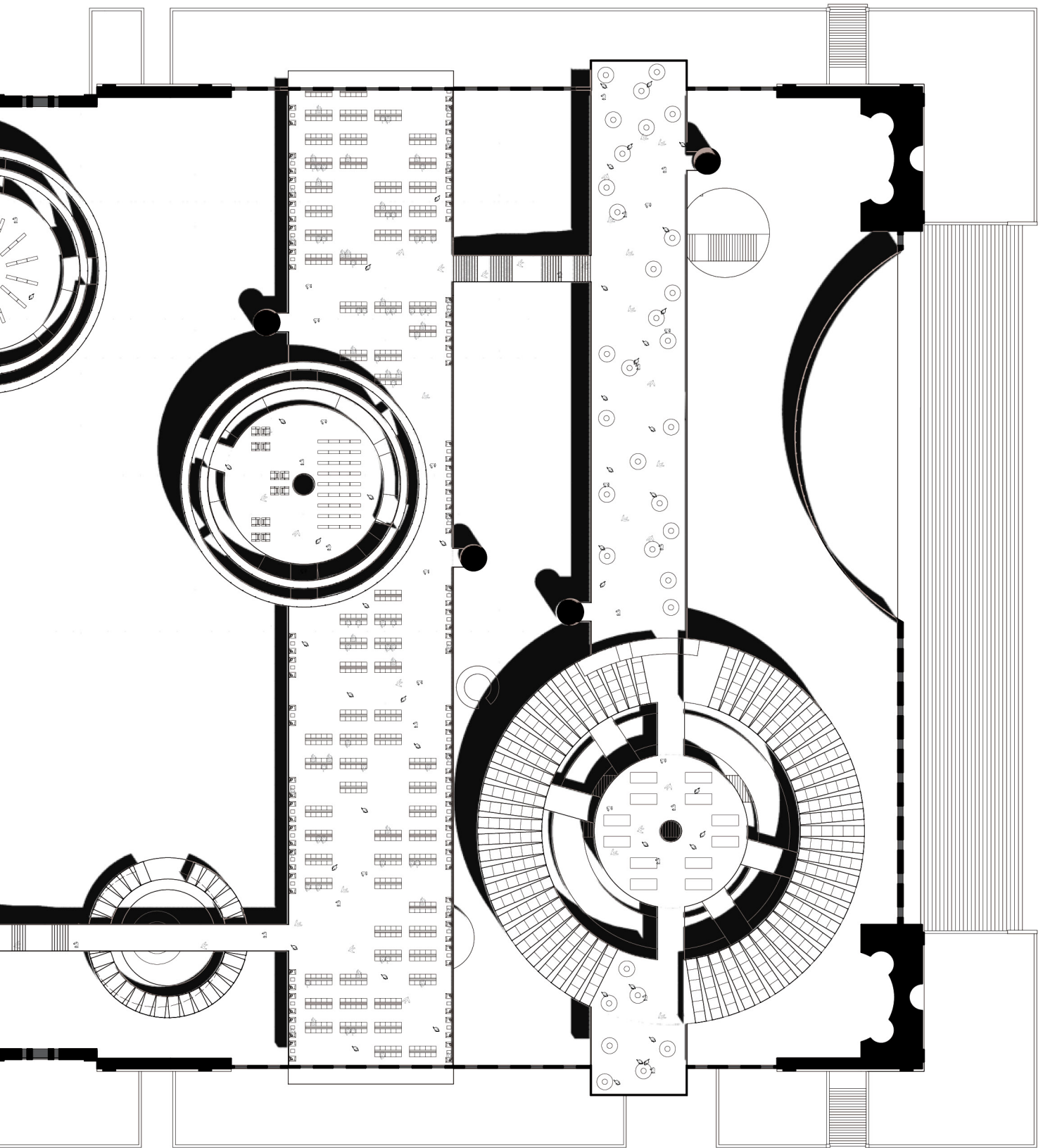
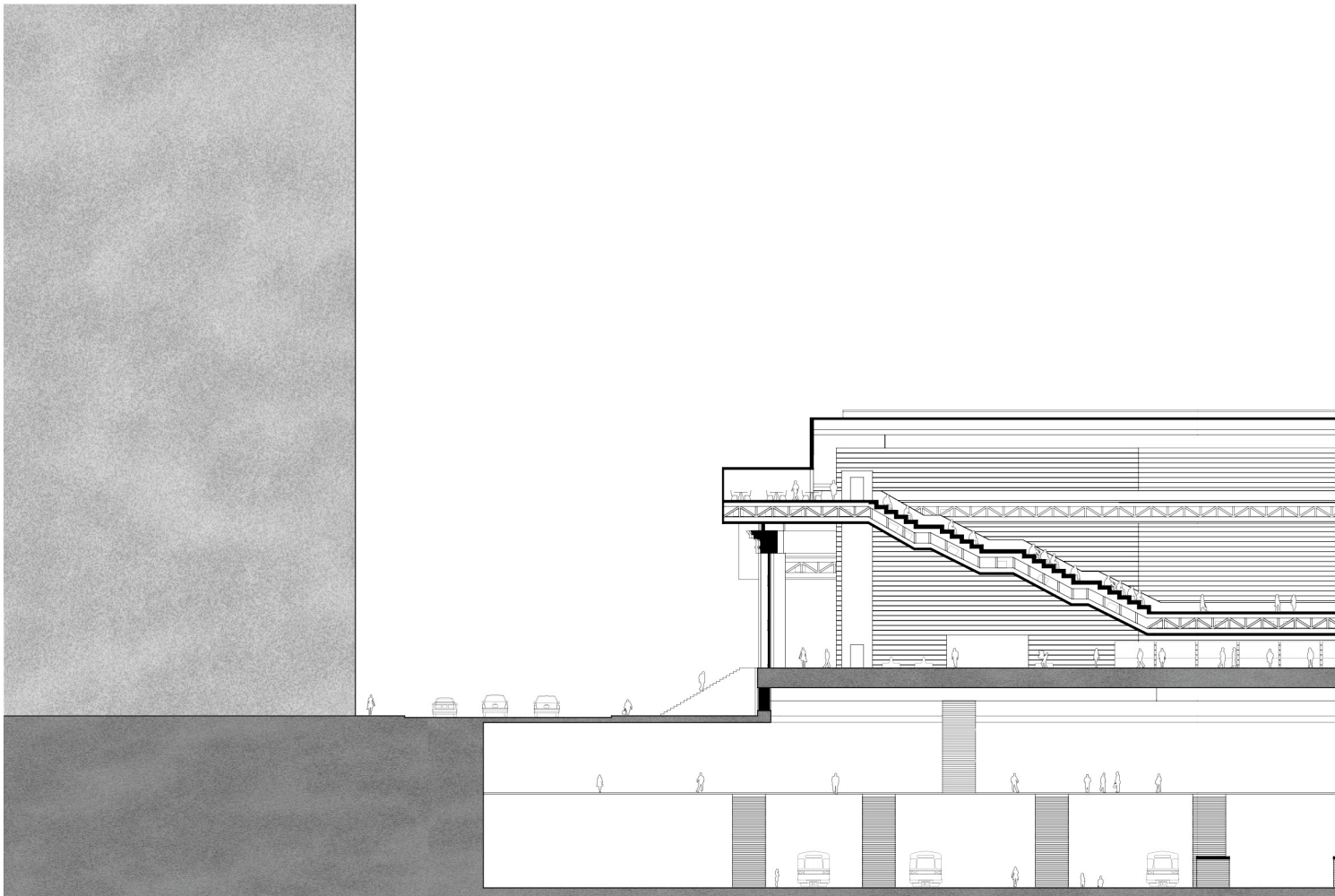
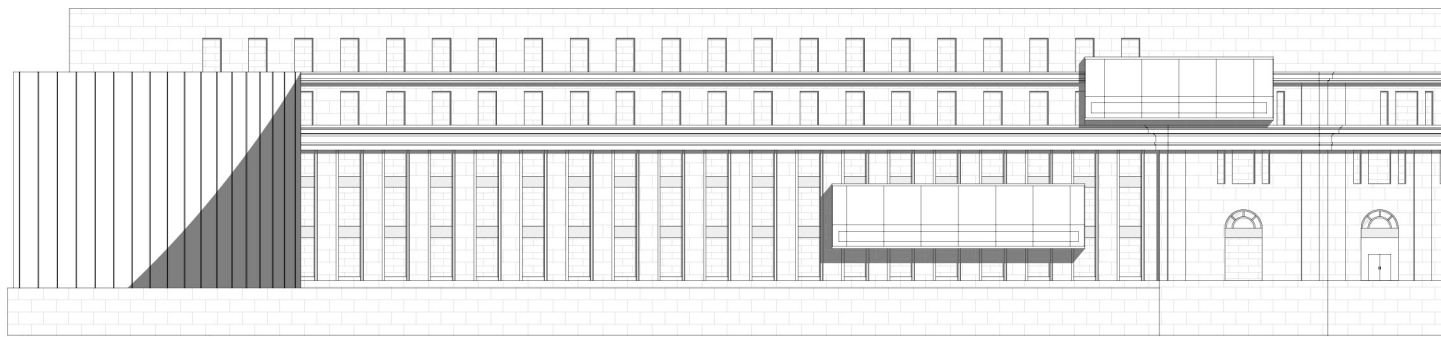
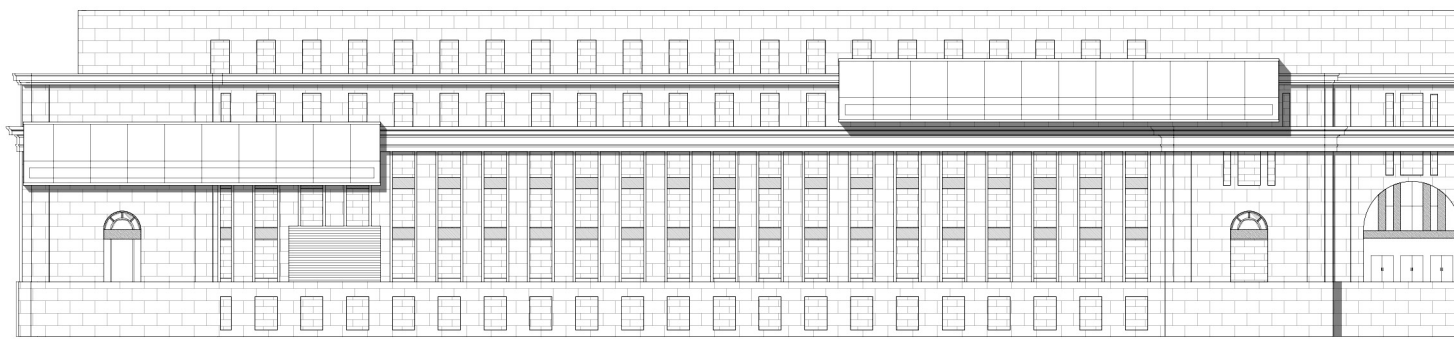


Fig. 48 Under Roof Plan: Farley Building

FARLEY BUILDING





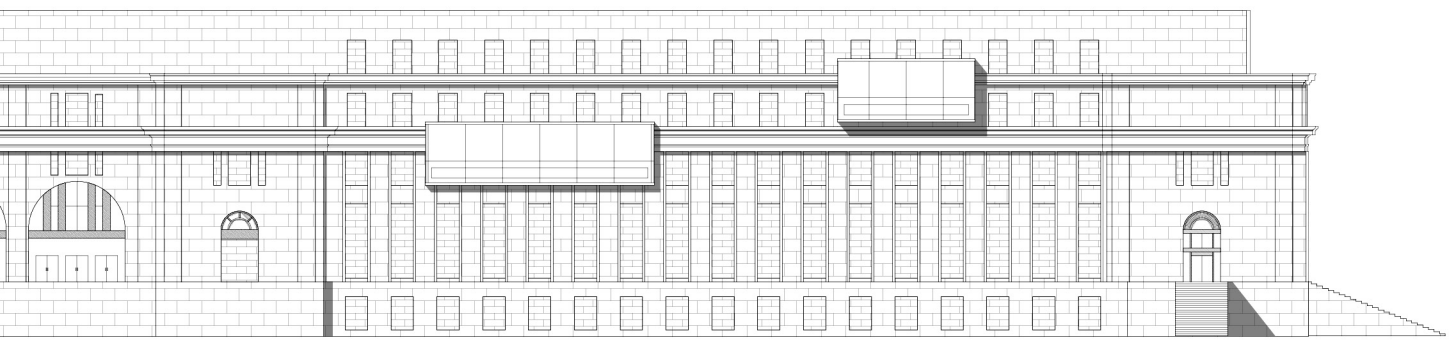


Fig. 49 North Elevation: Farley Building

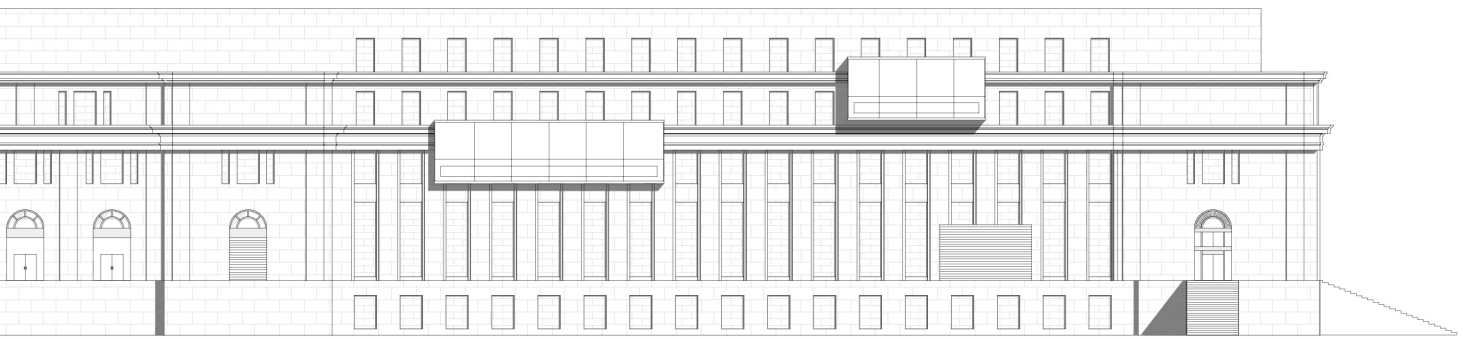


Fig. 50 South Elevation: Farley Building

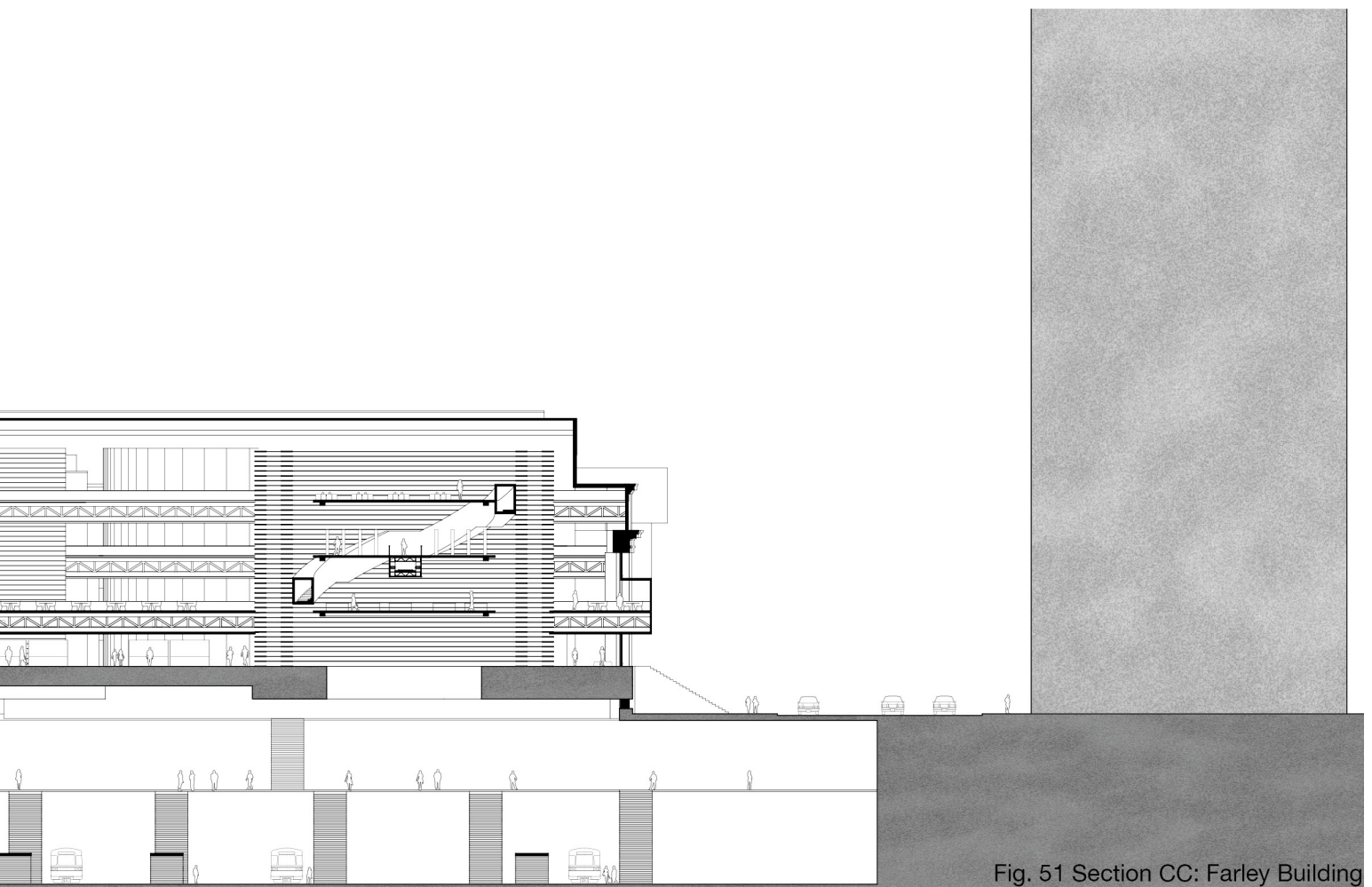


Fig. 51 Section CC: Farley Building













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## APPENDICES

- A. Time Line of United States Postal Service in relationship to Technological and Transportation advancements
- B. Large size drawings



## APPENDIX A

- Richard Fairbanks' tavern in Boston named first post repository in the colonies

- First establishment of a central postal organization in the colonies, under the British Crown

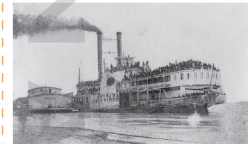
- Benjamin Franklin named first Postmaster General under Continental Congress
- Constitutional Post established, foundation for today's USPS

- Samuel Osgood named first Postmaster General under Constitution

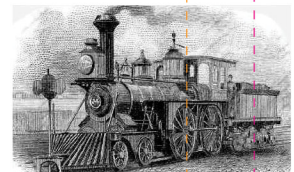
- Steamboats used

- First steamboat to sail continuously from Pittsburgh to New Orleans

- First recorded steam-powered boat in the US



- First steam powered locomotive



1639

1691

1774  
1775  
1776

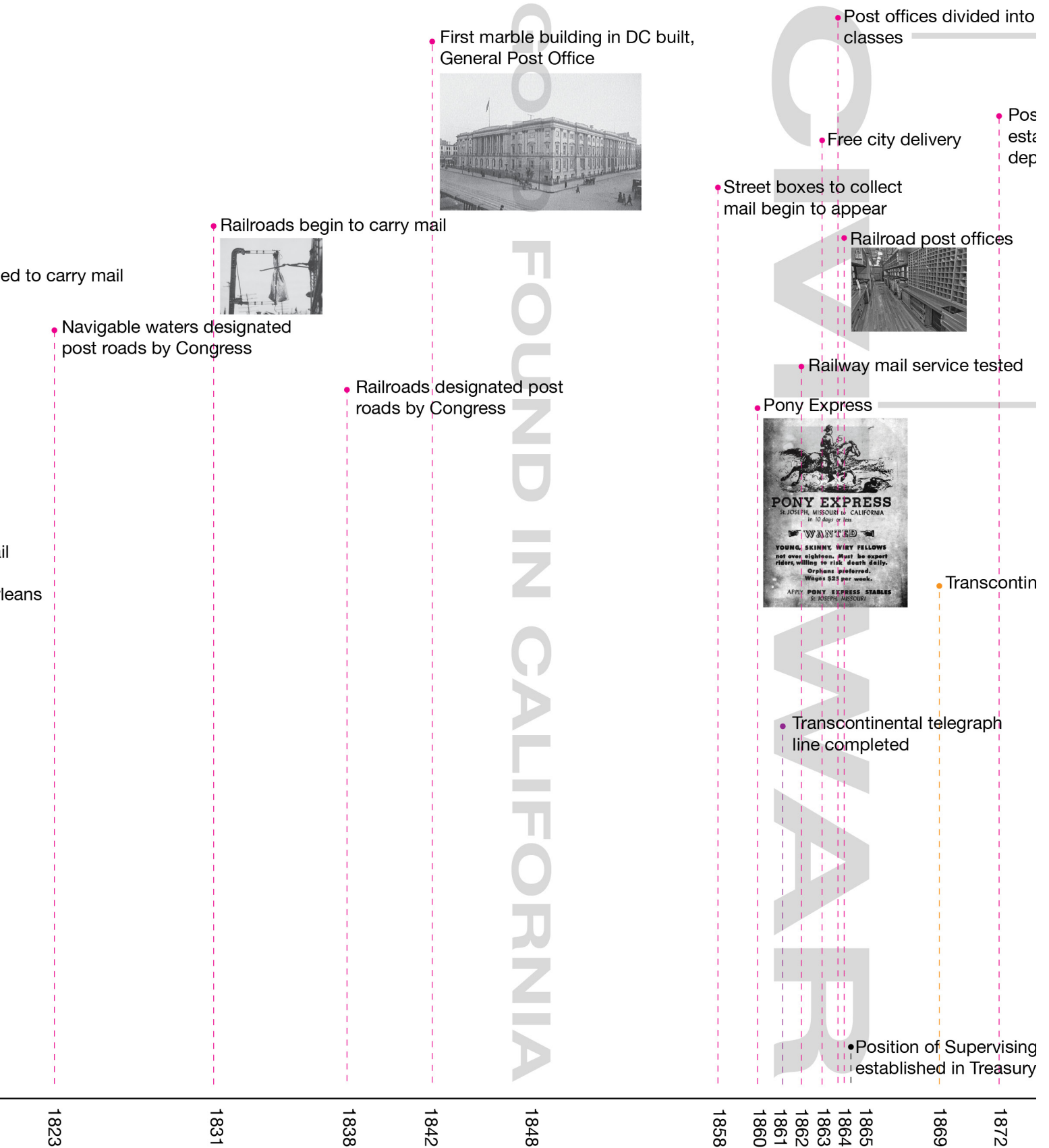
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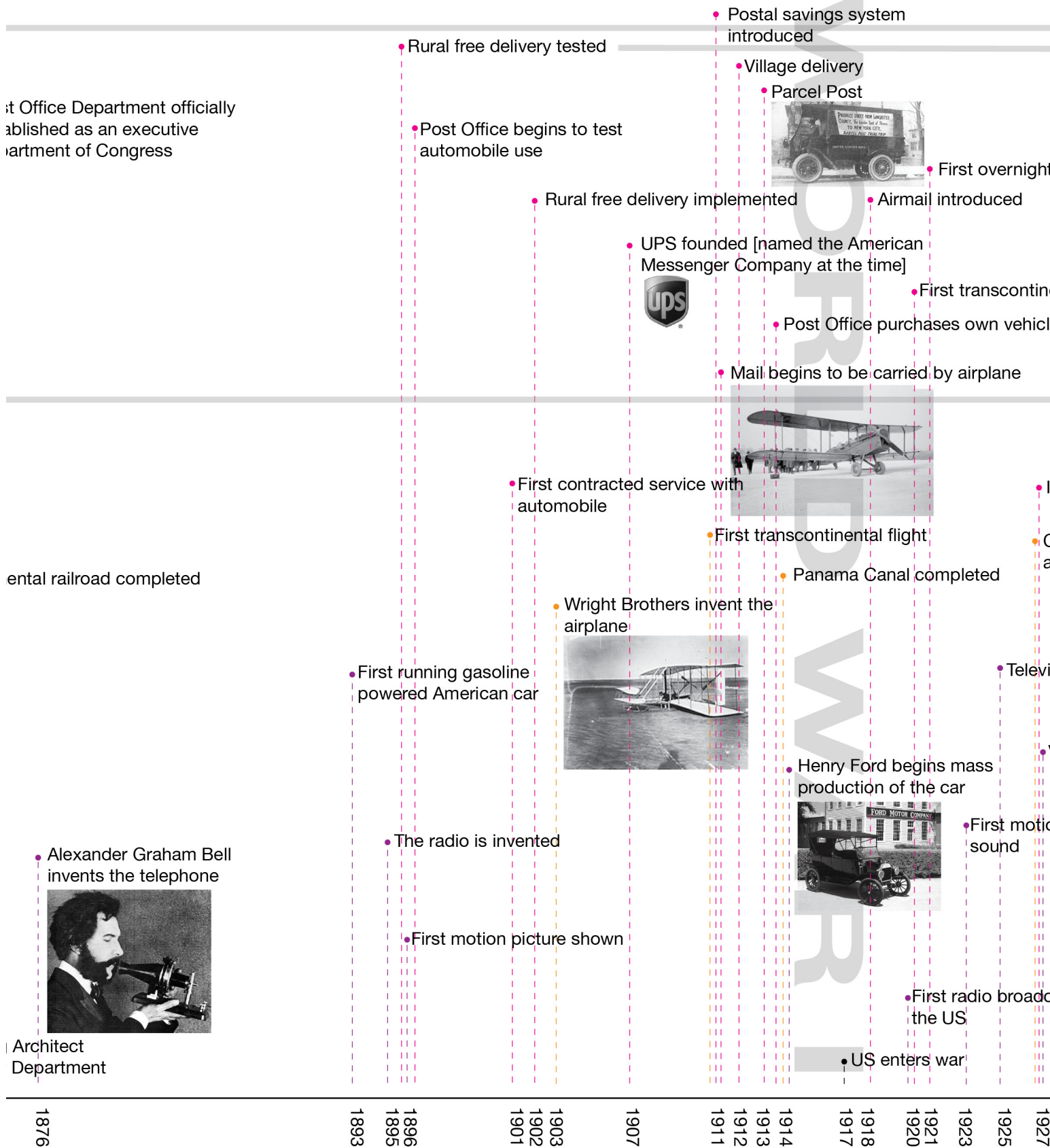
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1804

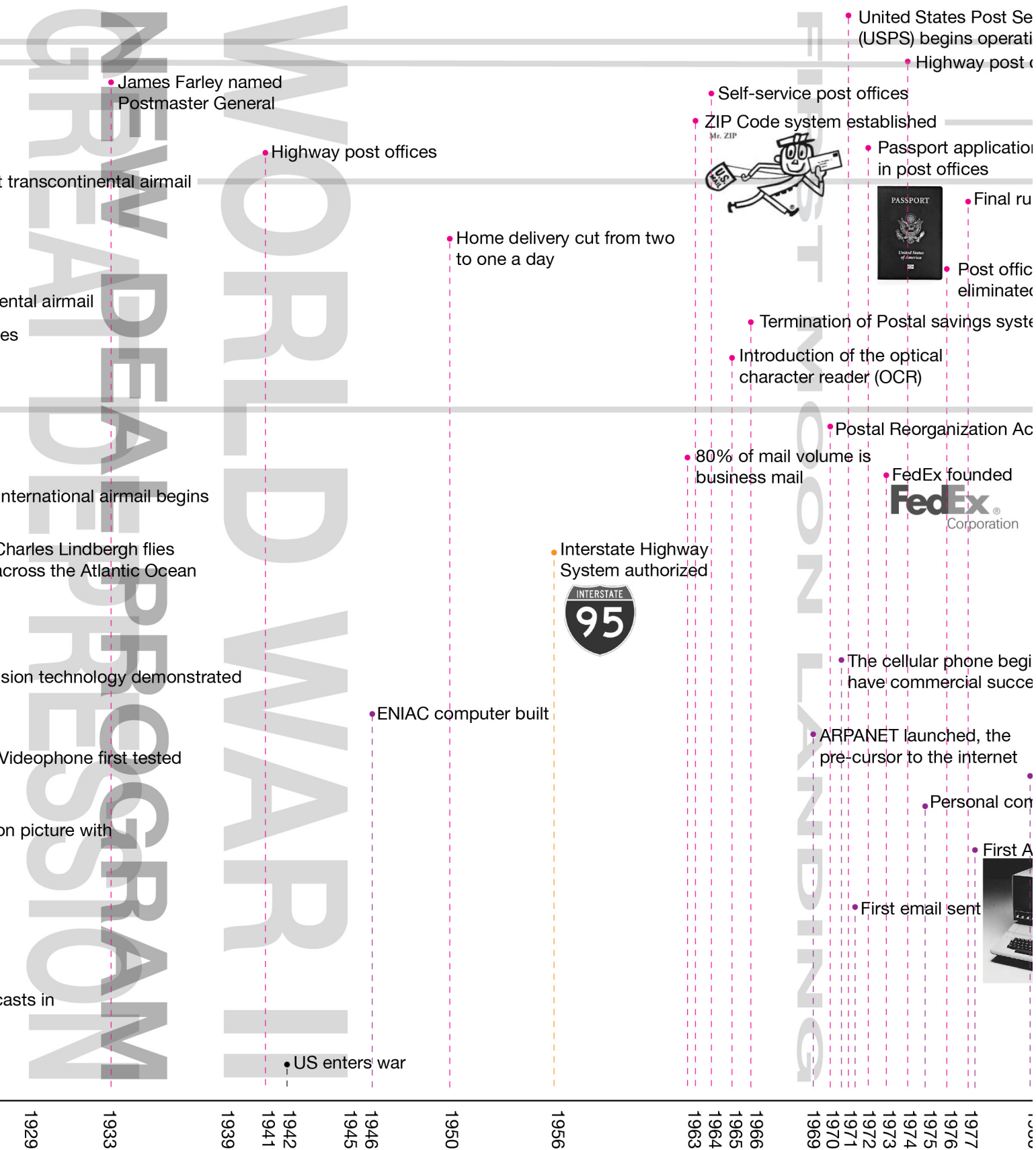
1811

1813









rvices  
on

offices terminated

- Retail terminals automate postal windows

ns accepted

n of railroad post office

- ZIP + 4 implemented

e class categories  
d

- Reorganization: area and district offices created; 30,000 positions cut

am

- Small parcel and bundle sorters

- USPS announces to cut 7,500 jobs and close 3,000 post offices

- OCR more widely used, automation begins

- Stamps sold through automatic teller machines



- Mass-production of hybrid vehicles begins

ns to  
ss

- World Wide Web launched

<http://www.>

- iPhone released



- iPad released

First instant chat server launched  
computers become accessible



- AIM launched

- Solar cell phone chargers introduced

pple II home computer sold



- Netflix founded

- Gmail launched

- PayPal launched



- Twitter launched

- Facebook launched

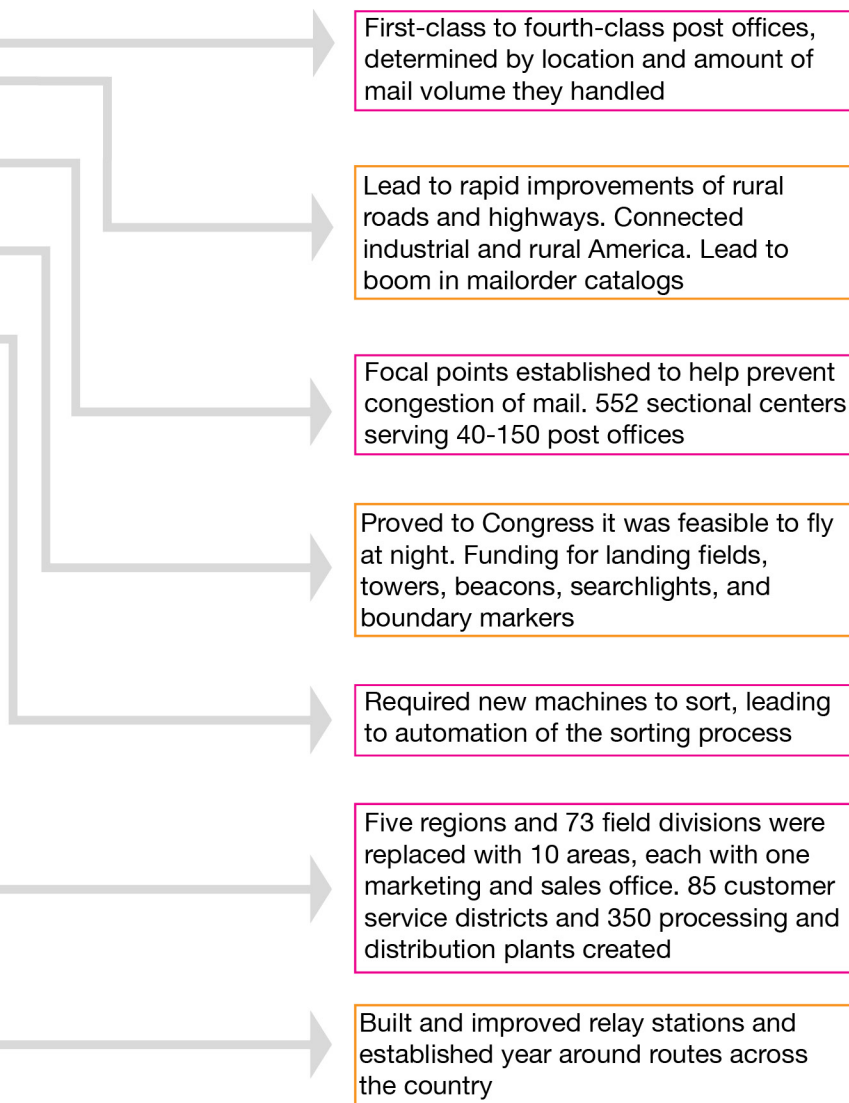


- IBM launches first personal computer

- Friendster launched

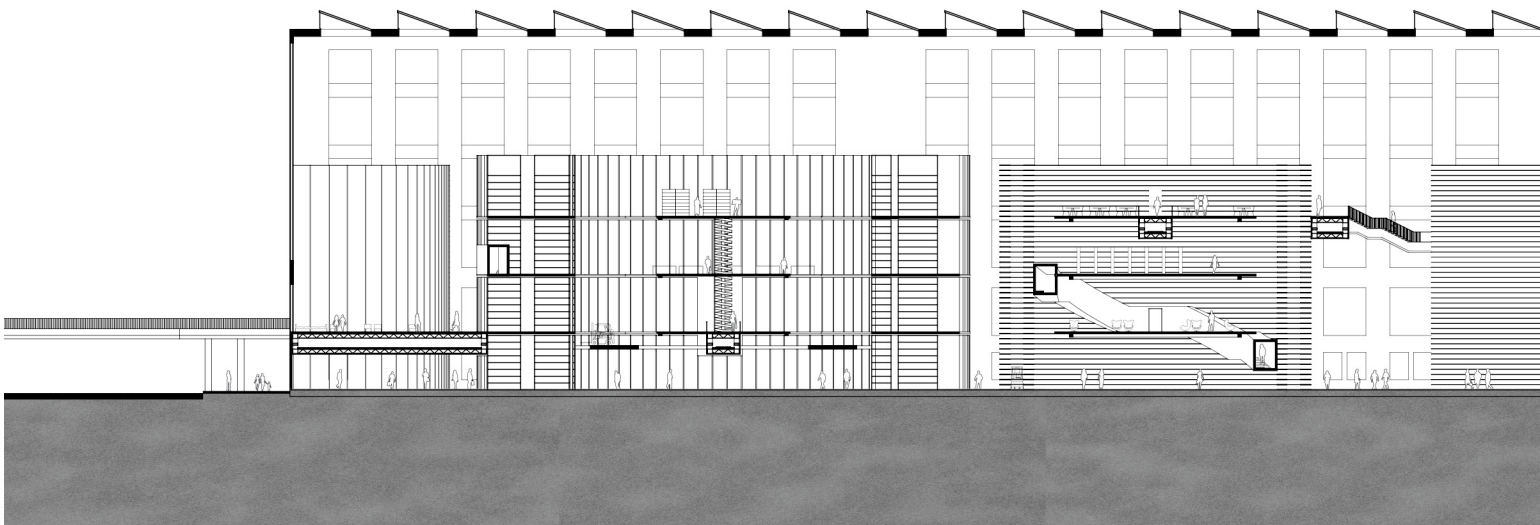
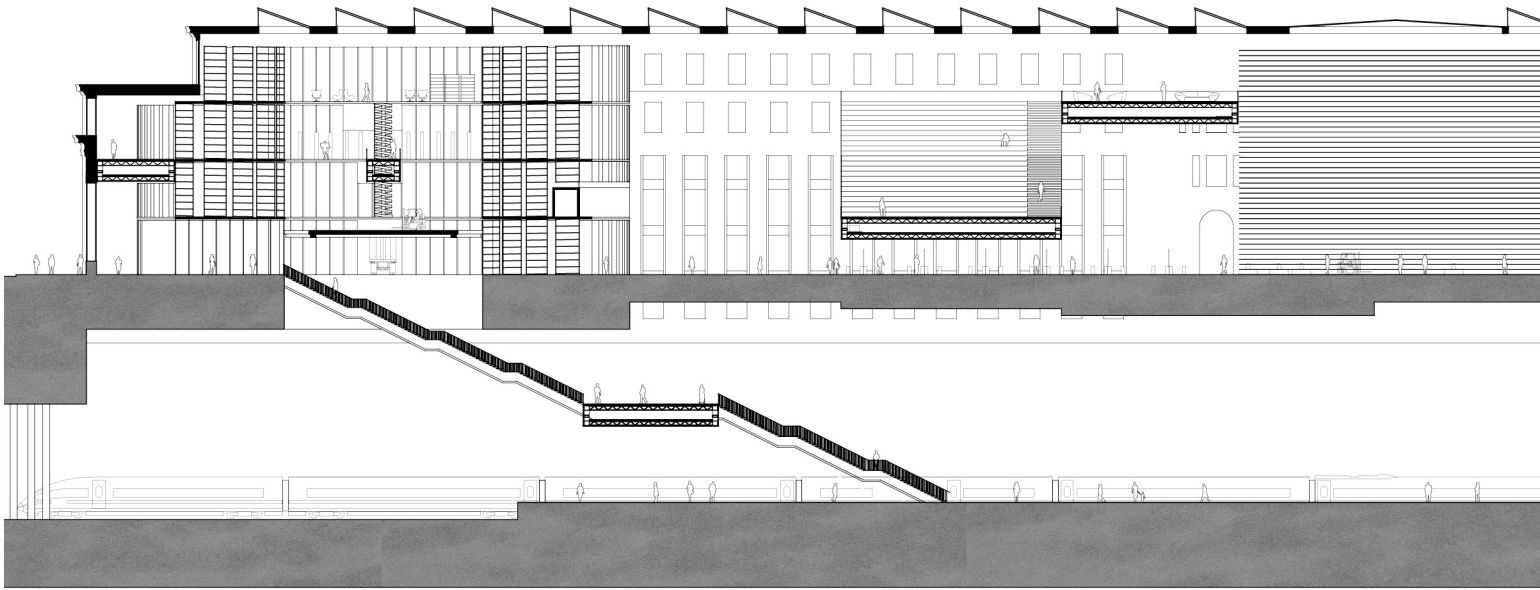
- Myspace launched

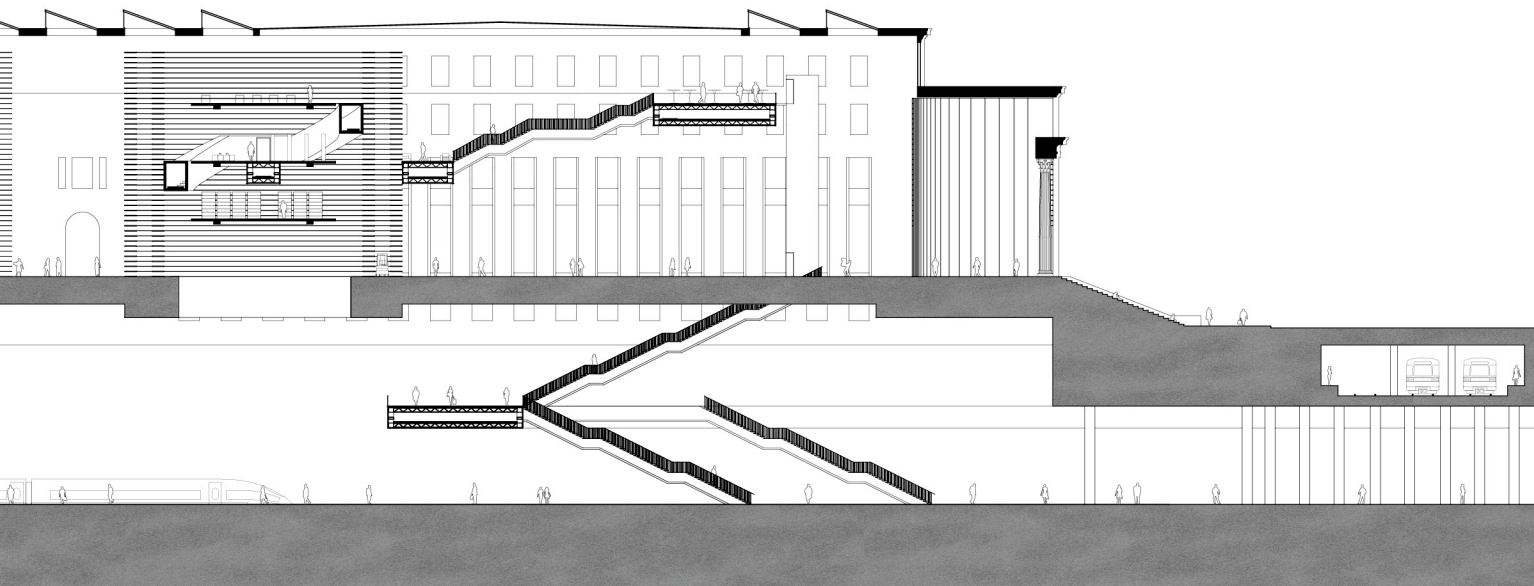
1980 1981 1982 1983 1984 1987 1991 1992 1997 1998 2001 2002 2003 2004 2006 2007 2010 2011



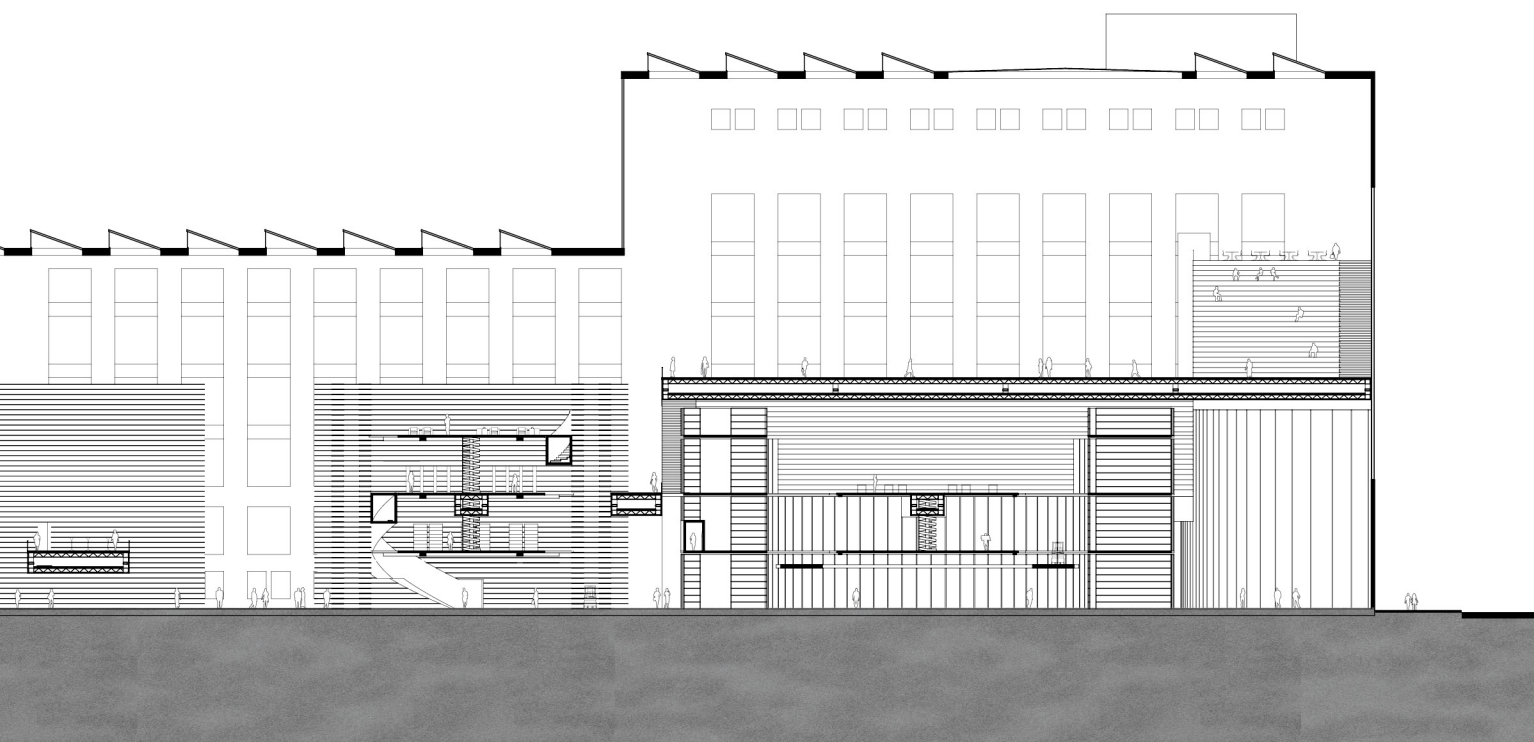


## APPENDIX B

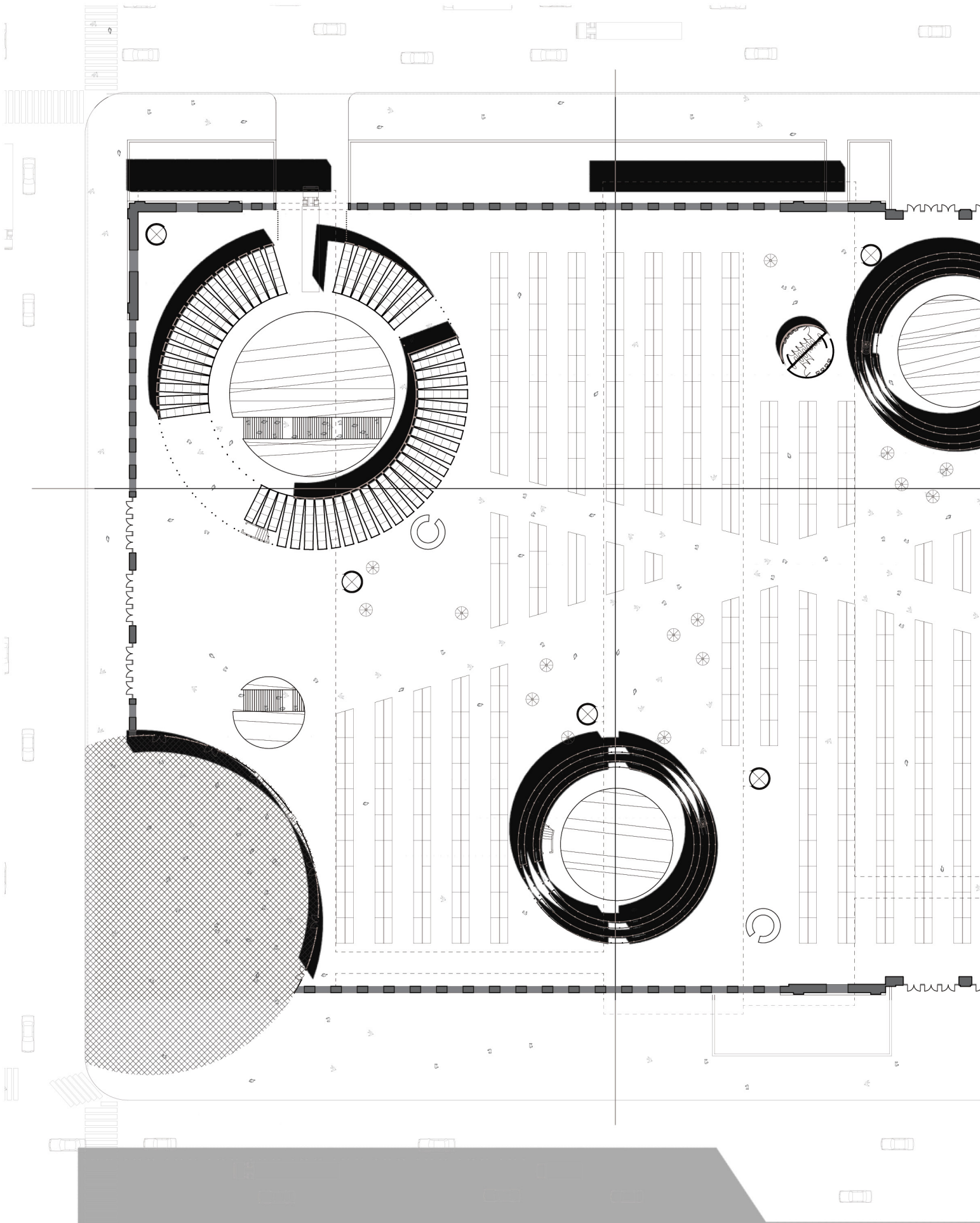




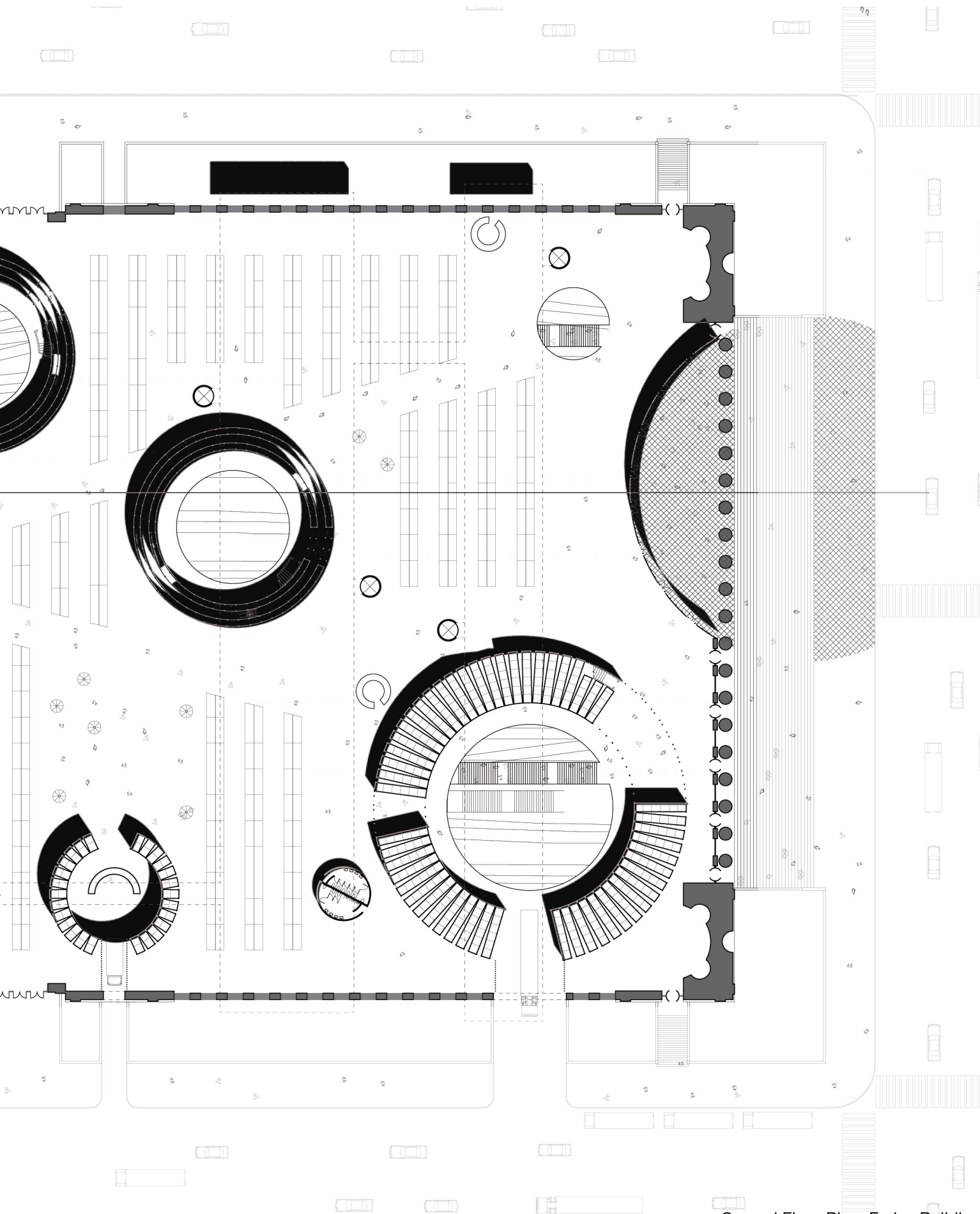
Section AA: Farley Building



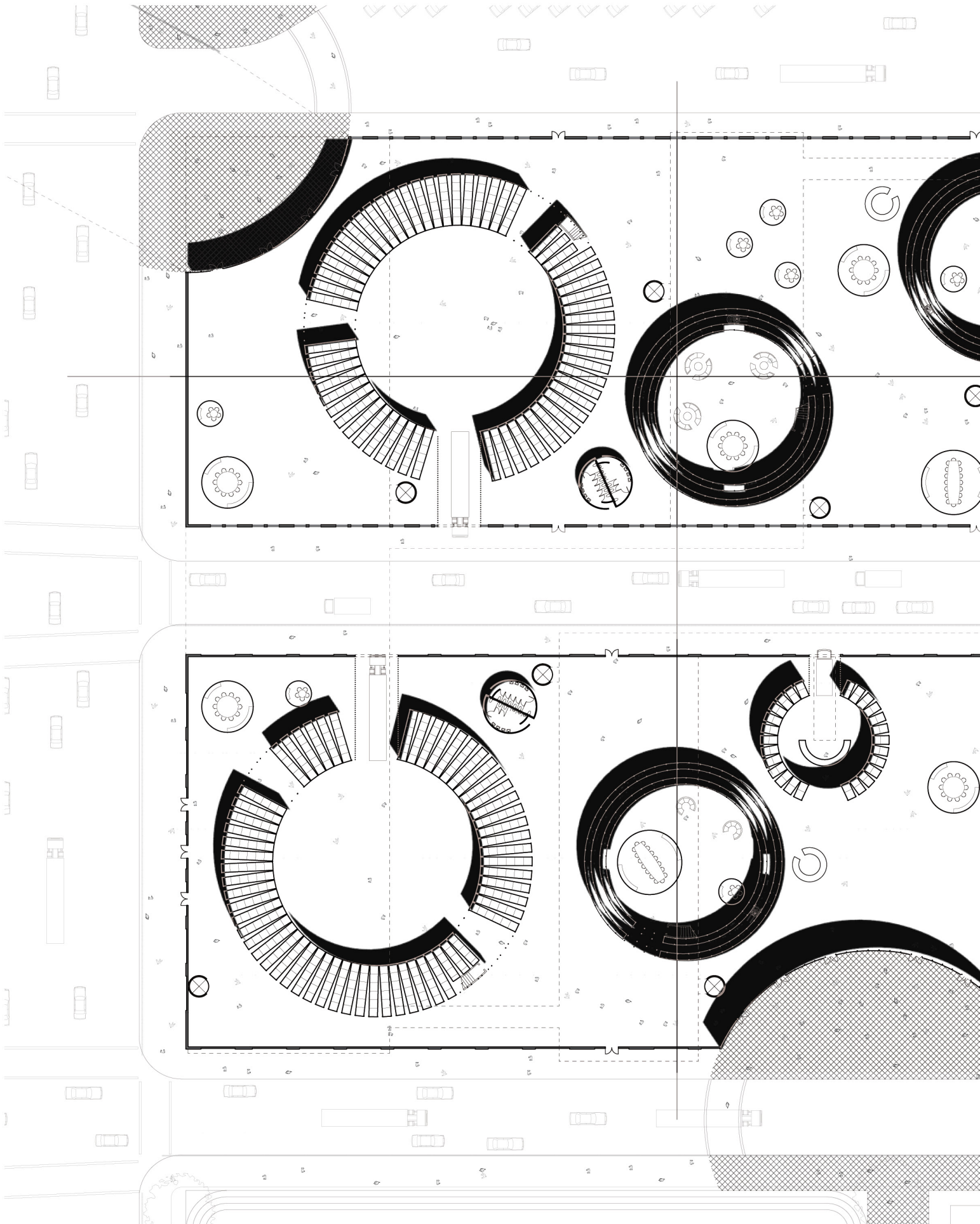
Section BB: Morgan Building



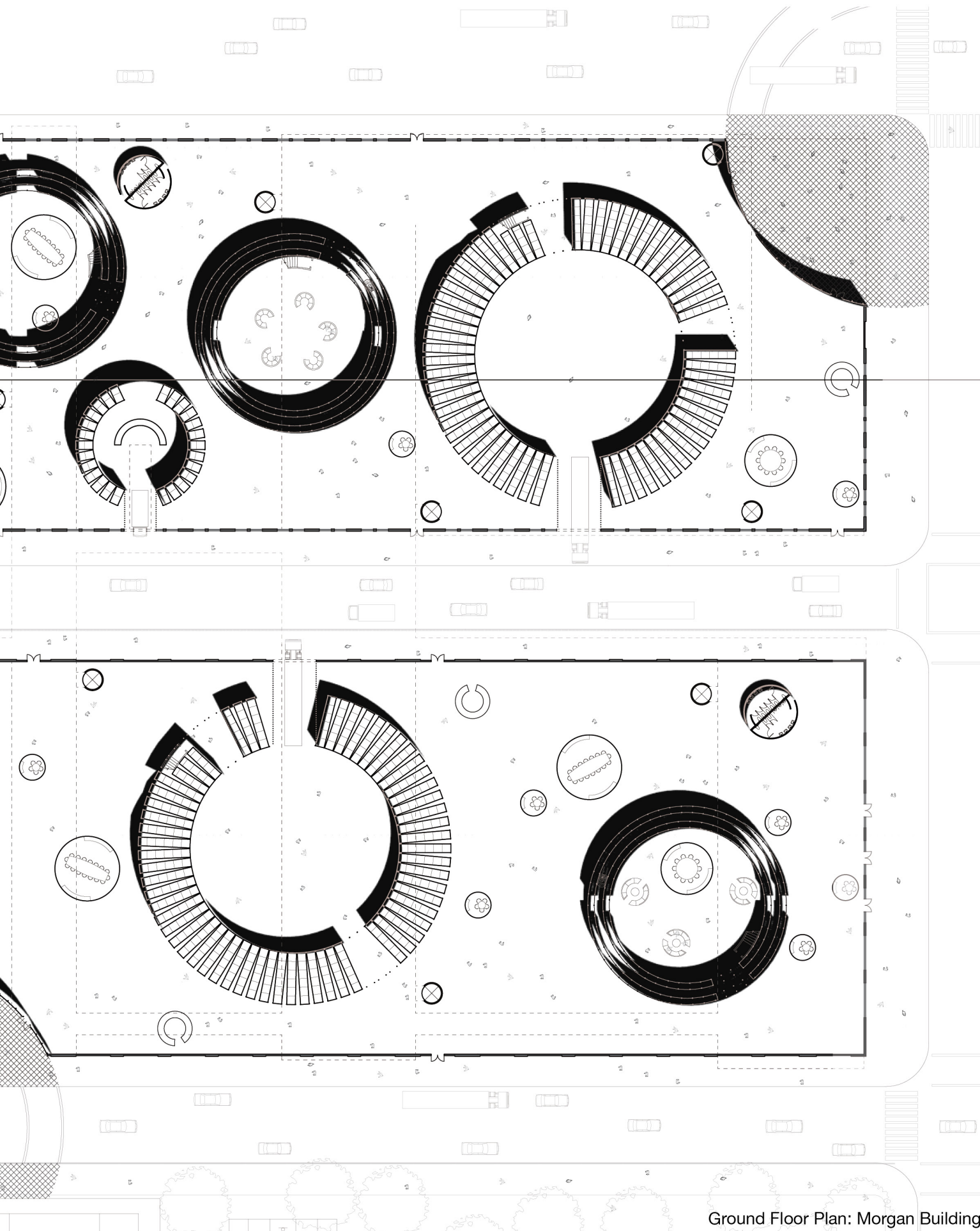




Ground Floor Plan: Farley Building







Ground Floor Plan: Morgan Building